

Replace Boiler Plant Generator

VAMC Building 7 / 9

Project No. 558-11-102FCA

Department of Veterans Affairs Medical Center

508 Fulton Street, Durham, North Carolina

Architect:
Roughton Nickelson De Luca Architects, PA
Durham, North Carolina

Owner:
Veterans Affairs Medical Center
Durham, North Carolina

Civil Engineer/Landscape Architect:
Coulter Jewell Thames, PA
Durham, North Carolina

PM&E Engineer:
Edmondson Engineers, PA
Durham, North Carolina

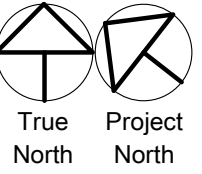
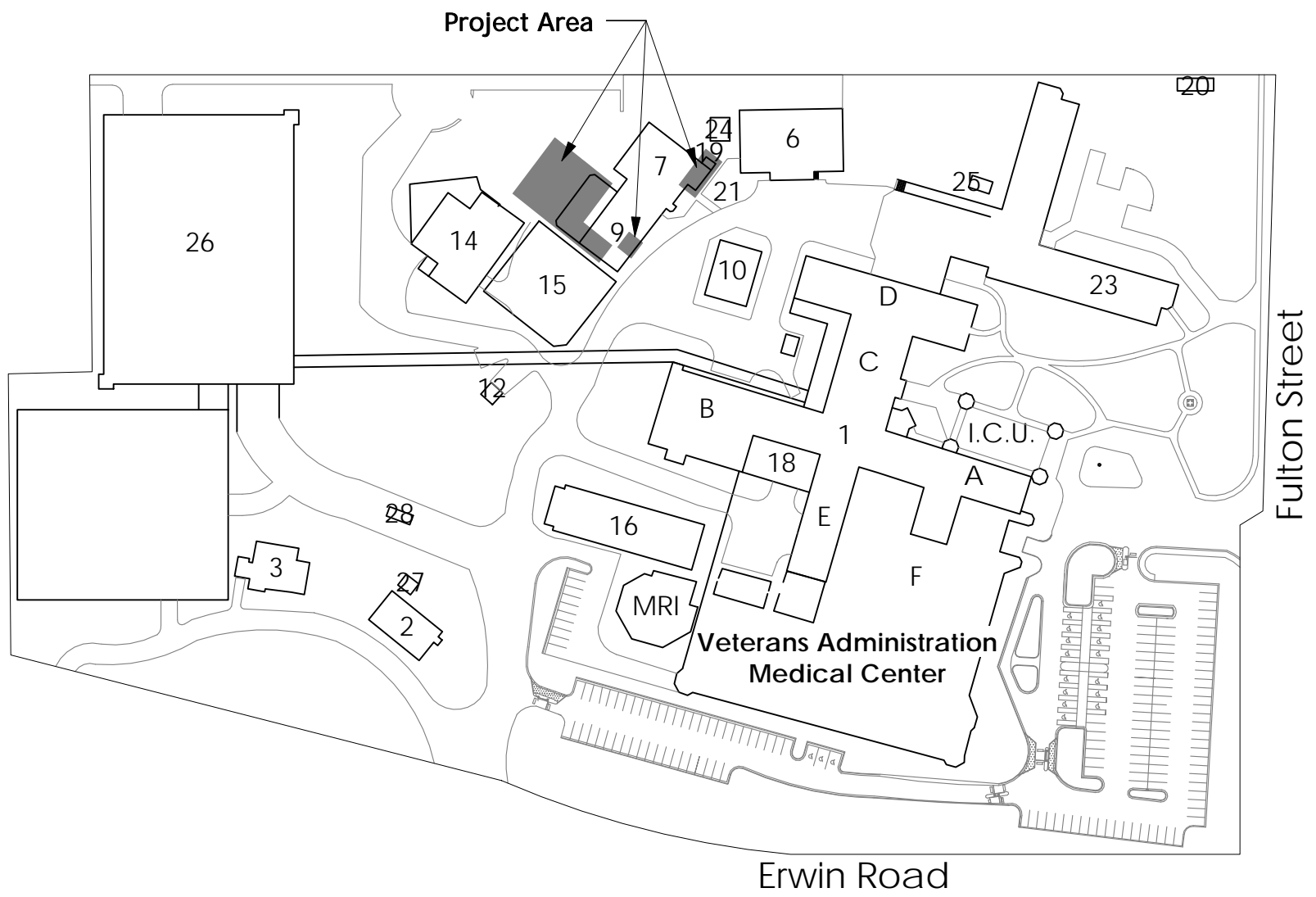
Asbestos Abatement:
S&ME, Inc.
Greensboro, North Carolina

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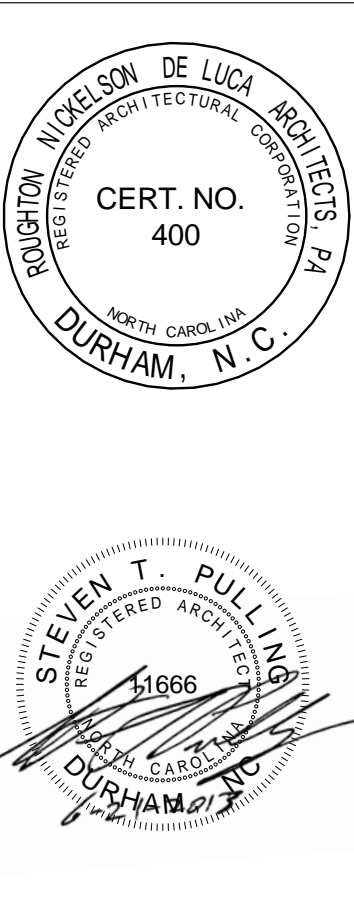
Construction Documents

Key Plan



Not to Scale

ROUGHTON-NICKELSON-DE LUCA
Architects, PA



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Construction Documents

REVISIONS		
REV.	DESCRIPTION	DATE

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RECOMMEND APPROVAL

Chief of Service:	Date:
Chief of Engineering:	Date:
Associate Director:	Date:
Director:	Date:
Chief of Staff:	Date:
Infection Control:	Date:
Chief of Police:	Date:
Emergency Management:	Date:
Privacy Officer:	Date:

Drawing Title Cover Sheet			
Approved Chief, Engineering Inc.		Date:	
APPROVED BY:			
MEDICAL CENTER DIRECTOR			
Replace Boiler Plant Generator			
Building No.	Designed by	Drawn by	Checked by
7 & 9	GDL/SIP	SIP/RS	SIP
Location VAMC - Durham 508 Fulton Street Durham, North Carolina			
Date:	21 June 2013		
Project No.	558-11-102FCA		
Project ID No.	13-E-07		
DRAWING NO. G001			
Sheet of			

Department of
VETERANS AFFAIRS



**2012 APPENDIX B
BUILDING CODE SUMMARY
FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
(Reproduce the following data on the building plans sheet 1 or 2)**

Name of Project: **VAMC – Replace Boiler Plant Generator (VA Project No. 558-11-102FCA)**
 Address: Veterans Affairs Medical Center, 508 Fulton Street, Durham, North Carolina Zip Code: 27705
 Proposed Use: Same as existing, facility boiler and chiller plant, with addition of new emergency generator and associated electrical system equipment, and minor interior office alteration.
 Owner/Authorized Agent: **VAMC/Charles Williams** Phone: (919) 286-6922 ext 2292 E-Mail: charles.williams007@va.gov
 Owned By: ☐ City/County ☐ Private ☐ State ☒ VA
 Code Enforcement Jurisdiction: ☐ City ☐ County ☐ State ☒ VA

LEAD DESIGN PROFESSIONAL: Steven T. Pulling, AIA

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural:	RND Architects	Steven T. Pulling, AIA	11666	(919) 490-1266	steve@rndaarchitects.com
Civil:	Coulter Jewell Thames	Chuck Hill, PE	23461	(919) 682-0368	chill@cjta.com
Electrical:	Edmondson Engineers	Dennis Hayes, PE	028869	(919) 544-1936	dennis.hayes@edmondsonengineers.com
Fire Alarm:	Edmondson Engineers	Dennis Hayes, PE	028869	(919) 544-1936	dennis.hayes@edmondsonengineers.com
Plumbing:	Edmondson Engineers	Charles Crowl, PE	028862	(919) 544-1936	charles.crowl@edmondsonengineers.com
Mechanical:	Edmondson Engineers	Charles Crowl, PE	028862	(919) 544-1936	charles.crowl@edmondsonengineers.com
Sprinkler:	N/A	N/A	N/A	N/A	N/A
Standpipe:	N/A	N/A	N/A	N/A	N/A
Structural:	N/A	N/A	N/A	N/A	N/A
Retaining Walls >2' High:	N/A	N/A	N/A	N/A	N/A

2012 EDITION OF NC CODE FOR:

EXISTING: ☐ Reconstruction ☐ New Construction ☐ Addition ☐ Fit-up
☐ Alteration ☐ Repair ☐ Renovation

BUILDING 7/9 (B-7/9)

CONSTRUCTED: 1949 ORIGINAL USE(S) (Ch. 3): (F-1) Steam Plant (Coal-Fired Boilers). (VA Building 7)

RENOVATED: 1971 REVISED USE(S) (Ch. 3): (F-1) Steam Plant (Coal-Fired Boilers) (VA Building 7) and addition of (F-1) Chiller Plant. (VA Building 9)

RENOVATED: 1989 CURRENT USE(S) (Ch. 3): (F-1) Steam Plant (New Gas/Oil-Fired Boilers) and expansion of (F-1) Chiller Plant. (VA Building 7/9)

PROPOSED USE(S) (Ch. 3): (F-1) Steam and Chiller Plants, with New Emergency Electrical System Equipment.

RND architects – 1118 31 May 2013 VAMC – Replace Boiler Plant Generator

BASIC BUILDING DATA

Construction Type: ☐ I-A ☐ I-B ☐ II-A ☐ II-B ☐ III-A ☐ III-B ☐ IV ☐ V-A ☐ V-B

Sprinklers: ☐ No ☐ Partial ☐ Yes ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D

Standpipes: ☐ No ☐ Yes ☐ Class: ☐ I ☐ II ☐ III ☐ Wet ☐ Dry

Fire District: ☐ No ☐ Yes

Flood Hazard Area: ☐ No ☐ Yes

Building Height: (feet) 42

Gross Building Area:

Floor	Existing (Sq Ft)	New (Sq Ft)	Sub-Total (Sq Ft)
2 nd Floor:	N/A		
Mezzanine:	[293]		[293]
1 st Floor:	10,388		10,388
Basement:	532		532
TOTAL (Sq Ft)	10,920		10,920

ALLOWABLE AREA**OCCUPANCY:**

Assembly: ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5

Business: ☐

Educational: ☐

Factory: ☐ F-1 Moderate ☒ F-2 Low

Hazardous: ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM

Institutional: ☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4 ☐ I-5

I-3 Condition: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Mercantile: ☐

Residential: ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4

Storage: ☐ S-1 Moderate ☐ S-2 Low ☐ High-Piled ☐ Enclosed ☐ Repair Garage

Utility and Miscellaneous: ☐

Accessory Occupancies: N/A

Assembly: ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5

Business: ☐

Educational: ☐

Factory: ☐ F-1 Moderate ☐ F-2 Low

Hazardous: ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM

Institutional: ☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4 ☐ I-5

I-3 Condition: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Mercantile: ☐

Residential: ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4

Storage: ☐ S-1 Moderate ☐ S-2 Low ☐ High-Piled ☐ Enclosed ☐ Repair Garage

Utility and Miscellaneous: ☐

Incidental Uses (Table 508.2.5): N/A

☐ Furnace room where any piece of equipment is over 400,000 Btu per hour input.

☐ Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower.

☐ Refrigerant machine room.

☐ Hydrogen cutoff rooms, not classified as Group H.

☐ Incinerator rooms.

☐ Paint shops, not classified as Group H, located in occupancies other than Group F.

☐ Laboratories and vocational shops, not classified as Group H, located in a Group E or I-2 occupancy.

☐ Laundry rooms over 100 square feet.

☐ Group I-3 cells equipped with padded surfaces.

☐ Group I-2 waste and linen collection rooms.

☐ Waste and linen collection rooms over 100 square feet.

☐ Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons, or a lithium-ion capacity of 1,000 pounds used for facility standby power, emergency power, or uninterrupted power supplies.

☐ Rooms containing fire pumps.

☐ Group I-2 storage rooms over 100 square feet.

☐ Group I-2 commercial kitchens.

☐ Group I-2 laundries equal to or less than 100 square feet.

☐ Group I-2 rooms or spaces that contain fuel-fired heating equipment.

Special Uses: ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 410 ☐ 411 ☐ 412
☐ 413 ☐ 414 ☐ 415 ☐ 416 ☐ 417 ☐ 418 ☐ 419 ☐ 420 ☐ 421 ☐ 422 ☐ 423
☐ 424 ☐ 425 ☐ 426 ☐ 427 **N/A**

Special Provisions: ☐ 509.2 ☐ 509.3 ☐ 509.4 ☐ 509.5 ☐ 509.6 ☐ 509.7 ☐ 509.8 ☐ 509.9 **N/A**

MIXED OCCUPANCY: ☒ No ☐ Yes Separation: _____ Hr. Exception: _____☐ Incidental Use Separation (508.2.5).

This separation is not exempt as a Non-Separated Use (see exceptions).

☐ Non-Separated Use (508.3).

The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.

☐ Separated Use (508.4) - See below for area calculations.

For each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} + \dots \leq 1.00$$

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 503 ² AREA	(C) AREA INCREASE FOR SPINKLERS FRONTAGE (I) ¹	(D) AREA INCREASE FOR SPINKLERS (I) ¹	(E) ALLOWABLE AREA OR UNLIMITED ³	(F) MAXIMUM BUILDING AREA ⁴
1	F-1	10,388	(11B/F-1) 15,500		N/A	22,165	44,330

1. Frontage area increase from Section 506.2 is computed thus:

a. Perimeter which fronts a public way or open space having 20 feet minimum width = _____ ft (F)

b. Total Building Perimeter = _____ ft (P)

c. Ratio (F/P) = _____ (F/P)

d. W = Minimum width of public way = _____ ft (W)

e. Percent of frontage increase I = 100(F/P - 0.25) x W/30] = _____ (%)

2. The sprinkler increase per Section 506.3 is as follows:

a. Multi-story building I_s = 200 percentb. Single story building I_s = 300 percent

3. Unlimited area applicable under conditions of Section 507.

4. Maximum Building Area = total number of stories in the building x E (506.4).

5. The maximum area of open parking garages must comply with Table 406.3.5. The maximum area of air traffic control towers must comply with Table 412.1.2.

	ALLOWABLE HEIGHT	INCREASE FOR SPRINKLERS	SHOWN ON PLANS	CODE REFERENCE
Type of Construction	TABLE 503	TYPE IIB	TYPE IIB	
Building Height in Feet	55	Feet = H + 20' = N/A	42	
Building Height in Stories	2	Stories + 1 = N/A	1	

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (Feet)	REQ'D	RATING PROVIDED (W/ ± REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
Structural Frame (including columns, girders, trusses):		0	0	N/A	N/A	N/A	N/A
Bearing Walls:							
Exterior:							
North:	≥ 30	0	0	N/A	N/A	N/A	N/A
East:	≥ 30	0	0	N/A	N/A	N/A	N/A
West:	5.15	1	1	Existing	N/A	N/A	N/A
South:	≥ 30	0	0	N/A	N/A	N/A	N/A
Interior:		0	0	N/A	N/A	N/A	N/A
Nonbearing Walls and Partitions:							
Exterior:							
North:	≥ 30	0	0	N/A	N/A	N/A	N/A
East:	≥ 30	0	0	N/A	N/A	N/A	N/A
West:	6.25	1	1	Existing	N/A	N/A	N/A
South:	≥ 30	0	0	N/A	N/A	N/A	N/A
Interior:		0	0	N/A	N/A	N/A	N/A
Floor Construction (including supporting beams and joists):		0	0	N/A	N/A	N/A	N/A
Roof Construction (including supporting beams and joists):		0	0	N/A	N/A	N/A	N/A
Shaft Enclosures – Ext:		1	N/A	N/A	N/A	N/A	N/A
Shaft Enclosures – Other:		1	N/A	N/A	N/A	N/A	N/A
Corridor Separation:		1	N/A	N/A	N/A	N/A	N/A
Occupancy Separation:		0	1	5/A301	U419	W-L-5047 W-L-1297 W-L-1176	HW-D-0042 HW-D-0049 WW-D-0050
Party/Fire Wall Separation:		N/A	N/A	N/A	N/A	N/A	N/A
Smoke Barrier Separation:		N/A	N/A	N/A	N/A	N/A	N/A
Tenant Separation:		N/A	N/A	N/A	N/A	N/A	N/A
Incidental Use Separation:		N/A	N/A	N/A	N/A	N/A	N/A

* Indicate section number permitting reduction.

** Between 8-7/9 and Addition to limit Group F-1 fire area to less than 12,000 square feet. (Re. 903.2.4)

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: ☐ No ☒ Yes

Exit Signs: ☐ No ☒ Yes

Fire Alarm: ☐ No ☒ Yes

Smoke Detection Systems: ☐ No ☒ Yes ☐ Partial _____

Panic Hardware: ☐ No ☒ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: _____

☒ Fire and/or smoke rated wall locations (Chapter 7)

☒ Assumed and real property line locations

☒ Exterior wall opening area with respect to distance to assumed property lines (705.8)

☒ Existing structures within 30' of the proposed building

☐ Occupancy types for each area as it relates to occupant load calculation (Table 1004.1.1)

☐ Occupant loads for each area

☐ Exit access travel distances (1016)

☐ Common path of travel distances (1014.3 & 1028.8)

☐ Dead end lengths (1018.4)

☐ Clear exit widths for each exit door

☐ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.1)

☐ Actual occupant load for each exit door

☐ A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation

☐ Location of doors with panic hardware (1008.1.10)

☐ Location of doors with delayed egress locks and the amount of delay (1008.1.9.7)

☐ Location of doors with electromagnetic egress locks (1008.1.9.8)

☐ Location of doors equipped with hold-open devices

☐ Location of emergency escape windows (1029)

☐ The square footage of each fire area (902)

☐ The square footage of each smoke compartment (407.4)

☐ Note any code exceptions or table notes that may have been utilized regarding the items above.

ACCESSIBLE DWELLING UNITS (SECTION 1107) N/A

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED

ACCESSIBLE PARKING (SECTION 1106) N/A

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES		NUMBER OF ACCESSIBLE SPACES PROVIDED:			TOTAL NUMBER OF ACCESSIBLE SPACES PROVIDED
	REQUIRED	PROVIDED	REGULAR WITH 5' ACCESS AISLE	132" ACCESS AISLE	8' ACCESS AISLE	
TOTAL:						

RND architects – 1118 31 May 2013 VAMC – Replace Boiler Plant Generator

STRUCTURAL DESIGN N/A

DESIGN LOADS:

Importance Factors: Wind (I_w) _____
 Snow (I_s) _____
 Seismic (I_e) _____

Live Loads: Roof: _____ PSF
 Mezzanine: _____ PSF
 Floor: _____ PSF

Ground Snow Load: _____ PSF

Wind Load: Basic Wind Speed _____ MPH (ASCE-7)
 Exposure Category _____
 Wind Base Shears (for MWFRS) V_x = _____ V_y = _____

SEISMIC DESIGN CATEGORY:☐ A ☐ B ☐ C ☐ D

Provide the following Seismic Design Parameters:

Occupancy Category (Table 1504.5): ☐ I ☐ II ☐ III ☐ IVSpectral Response Acceleration: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ FSite Classification (Table 1613.5.2): ☐ A ☐ B ☐ C ☐ D ☐ E ☐ FData Source: ☐ Field Test ☐ Presumptive ☐ Historical Data

Basic structural system (check one):

☐ Bearing Wall☐ Building Frame☐ Moment Frame

Dual w/Special Moment Frame

Dual w/Intermediate R/C or Special Steel

Inverted Pendulum

Seismic base shear: V_s = _____Analysis Procedure: ☐ Simplified ☐ Equivalent Lateral ForceArchitectural, Mechanical, Components anchored? ☐ Yes ☐ NoLATERAL DESIGN CONTROL: ☐ Earthquake ☐ Wind**SOIL BEARING CAPACITIES:**

Field Test (provide copy of test report): _____ PSF

Presumptive Bearing Capacity: _____ PSF

Pile Size, Type, and Capacity: _____

SPECIAL INSPECTIONS REQUIRED: ☐ Yes ☐ No**PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1) N/A**

USE	WATERCLOSETS		URINALS		LAVATORIES		SHOWERS/TUBS		DRINKING FOUNTAINS	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	REGULAR	ACCESSIBLE	REGULAR	ACCESSIBLE
SPACE	EXISTING									
	NEW									
	REQUIRED									

ENERGY REQUIREMENTS:

The following data shall be furnished minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs. annual energy cost for the proposed design.

Climate Zone: ☐ 3 ☐ 4 ☐ 5

Method of Compliance:

☐ Prescriptive (Energy Code)

☐ Performance (Energy Code)

☐ Prescriptive (ASHRAE 90.1)

☐ Performance (ASHRAE 90.1)

THERMAL ENVELOPE

Roof/ceiling Assembly (each assembly):

Description of assembly: _____

U-Value of total assembly: _____

R-Value of insulation: _____

Skylights in each assembly: _____

U-Value of skylight: _____

Total square footage of skylights in each assembly: _____

Exterior Walls (each assembly):

Description of assembly: _____

U-Value of total assembly: _____

R-Value of insulation: _____

Openings (windows or doors with glazing)

U-Value of assembly: _____

Solar heat gain coefficient: _____

Projection factor: _____

Door R-Values: _____

Walls below grade (each assembly):

Description of assembly: _____

U-Value of total assembly: _____

R-Value of insulation: _____

Floors – over unconditioned space (each assembly):

Description of assembly: _____

U-Value of total assembly: _____

R-Value of insulation: _____

Floors – slab on grade:

Description of assembly: _____

System No. HW-D-0049
XHBN.HW-D-0049
Joint Systems

Page Bottom

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

Joint Systems

See General Information for Joint Systems

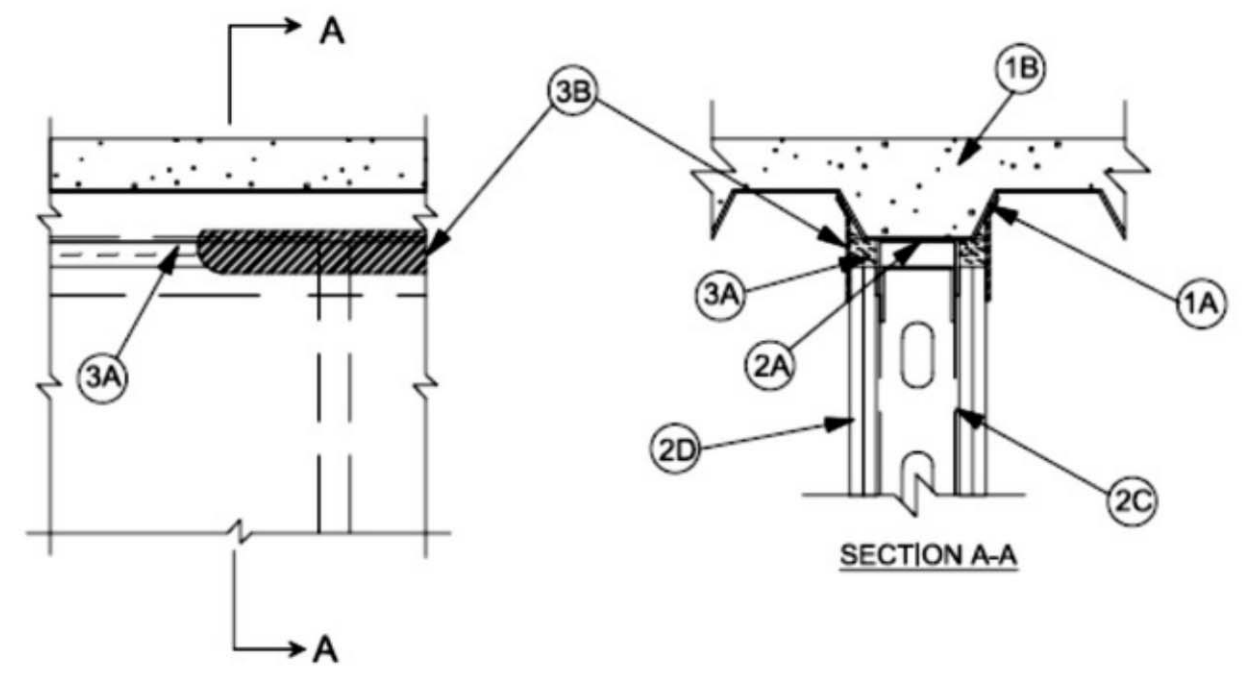
System No. HW-D-0049

January 11, 2013

Assembly Ratings – 1 and 2 Hr (See Items 2 and 3B)

Nominal Joint Width – 1 in.

Class II Movement Capabilities – 50% Compression Or Extension



1. **Floor Assembly** – The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor And Form Units*** – Max 3 in. (76 mm) deep galv steel fluted units.

B. **Concrete** – Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

C. **Spray-Applied Fire Resistive Materials*** – (Optional) - (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Roof Insulation** – Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the floor units.

1B. **Roof Assembly** – As an alternate to Items 1 and 1A, a fire rated protected fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

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W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

C1. **Light Gauge Framing* – Slotted Studs** – Slotted steel stud to be used in conjunction with **Light Gauge Framing* – Floor and Ceiling Runners** (Item 2A4). Slotted steel studs to be min 3-1/2 in. (64 mm) wide. Slotted steel studs cut 1 in. less in length than assembly height with bottom nesting in and secured to both ceiling and floor runners. Ceiling runner secured to perform slot within steel stud by means of No. 10 by 3/4 in. (19 mm) long low profile head steel screw. Floor runner attached to bottom of steel stud by means of No. 8 by 1/2 in. (13 mm) long pan head steel screw. Slotted steel stud spacing not to exceed 24 in. (610 mm) OC.

STEELER INC – Slotted Stud

C2. **Light Gauge Framing* – Slider C-Clip System** – As an alternate to the **Light Gauge Framing* – Slotted Steel Studs** (Item 2C1), a Slider C-Clip System consisting of a C-shaped steel clip with a slotted opening and a steel stud to be used in conjunction with **Light Gauge Framing* – Floor and Ceiling Runners** (Item 2A4). Steel clips and studs to be min 2-1/2 in. (64 mm) wide. Steel clip inserted inside flange of stud without attachment. Total length of steel stud cut 1 in. (25 mm) less than assembly height with bottom of steel stud nesting in and secured to floor runner. Floor runner attached to bottom of steel stud by means of No. 8 by 1/2 in. (13 mm) long pan head steel screw. Ceiling runner secured to steel C-Clip by means of No. 10 by 3/4 in. (19 mm) long pan head steel screw located 5/8 in. (10 mm) below top of ceiling runner. Top row of gypsum board screws shall be centered within the preformed slot of the C-Clip. Steel stud and steel clips nesting not to exceed 24 in. (610 mm) OC.

STEELER INC – Slider C Clip System

D. **Gypsum Board*** – Gypsum board installed to a min total thickness of 5/8 in. (16 mm) and 1-1/4 in. (32 mm) on each side of wall for 1 and 2 hr rated assemblies respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom of the steel floor units and the top row of screws shall be installed into the studs 3-1/2 (89 mm) to 4 in. (102 mm) below the lower surface of the floor. The hourly rating of the joint system is equal to the hourly fire rating of the wall.

3. **Joint System** – Max separation between bottom of floor and top of wall at time of installation of joint system is 1 in. (25 mm). The joint system is designed to accommodate a max 50 percent compression or extension from its installed width. The joint system consists of forming material and a fill material, as follows:

A. **Forming Material*** – Nom 5/8 in. (16 mm) and 1-1/4 in. (32 mm) wide strips of min 4 pcf (64 kg/m³) mineral wool batt used to accommodate steel studs (Item 2C1). Flange height of ceiling runner shall be min 3/4 in. (19 mm) greater than max extended joint width. Ceiling runner installed parallel to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

ROCK WOOL MANUFACTURING CO – Delta-Board

ROXUL INC – SAFE

THERMAFIBER INC – Type SAF

A1. **Forming Material*** – Strips – (Optional) - Nom 5/8 in. (16 mm) and 1-1/4 in. (32 mm) wide pre-cut mineral wool strips for 1 and 2 hr rated assemblies respectively. The strips are compressed 50 percent in thickness and firmly packed into the gap between the top of the gypsum board and bottom of the steel floor units on both sides of the wall. Adjoining lengths of strips to be tightly butted with butted seams spaced min 48 in. (1.2 m) apart along the length of the joint.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – CP 767 Speed Strips

B. **Fill, Void or Cavity Material*** – Min 1/16 in. (1.6 mm) dry thickness (min 1/8 in. or 3.2 mm wet thickness) of fill material sprayed or troweled on each side of the wall to completely cover mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto gypsum board and steel deck on both sides of wall. When spray-applied fire resistive material is applied to the steel floor and form units, the fill material is to overlap the gypsum board a min of 1/2 in. (13 mm) and the spray-applied fire resistive material is to overlap the steel floor units on both sides of wall. When spray-applied fire resistive materials are used, the CP672 firestop spray shall overlap the wall a min 1/2 in. (13 mm) and overlap the spray-applied fire resistive material a min of 2 in. (51 mm) on both sides of the wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – CP672 Firestop Spray or CFS-SF WB Firestop Joint Spray

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – CP672 Firestop Spray or CFS-SF WB Firestop Joint Spray

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HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC – CP672 Firestop Spray or CFS-SF WB Firestop Joint Spray

C. **Spray-Applied Fire Resistive Materials*** – (Optional, Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN – Type MK-6-HY

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Roof Insulation** – Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the floor units.

1B. **Roof Assembly** – As an alternate to Items 1 and 1A, a fire rated protected fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray-Applied Fire Resistive Materials*** – (Not Shown)–Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor units may be sprayed with the type and thickness of fire resistive material indicated in the individual P700 Series design.

2. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor And Ceiling Runners** – Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2C1). Flange height of ceiling runner shall be min 3/4 in. (19 mm) greater than max extended joint width. Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

A1. **Light Gauge Framing* – Slotted Ceiling Runner** – As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2C1). Slotted ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC. before optional spray-applied fire resistive material is used. Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS – SLIP-TRK

CALIFORNIA EXPANDED METAL PRODUCTS CO – CST

CLARKDIETRICH BUILDING SYSTEMS – Type SLT, SLT-H

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV – SDT250, SDT300

MARINO/WARE, DIV OF WARE INDUSTRIES INC – Type SLT

METAL-LITE INC – The System

OLMAR SUPPLY INC – STT250, STT300

SCAFCO STEEL STUD MANUFACTURING CO

TELLING INDUSTRIES L L C – True-Action Deflection Track

A2. **Light Gauge Framing* – Vertical Deflection Ceiling Runner** – When the nom joint width is less than or equal to 3/4 in. (19 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runners in Items 2A and 2A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with stop bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2C1). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

A2. **Light Gauge Framing* – Vertical Deflection Ceiling Runner** – When the nom joint width is less than or equal to 3/4 in. (19 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runners in Items 2A and 2A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with stop bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2C1). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

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A2. **Light Gauge Framing* – Vertical Deflection Ceiling Runner** – When the nom joint width is less than or equal to 3/4 in. (19 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runners in Items 2A and 2A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with stop bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2C1). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

A2. **Light Gauge Framing* – Vertical Deflection Ceiling Runner** – When the nom joint width is less than or equal to 3/4 in. (19 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runners in Items 2A and 2A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with stop bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2C1). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of weld

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XHEZ.W-L-1176
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

Through-penetration Firestop Systems

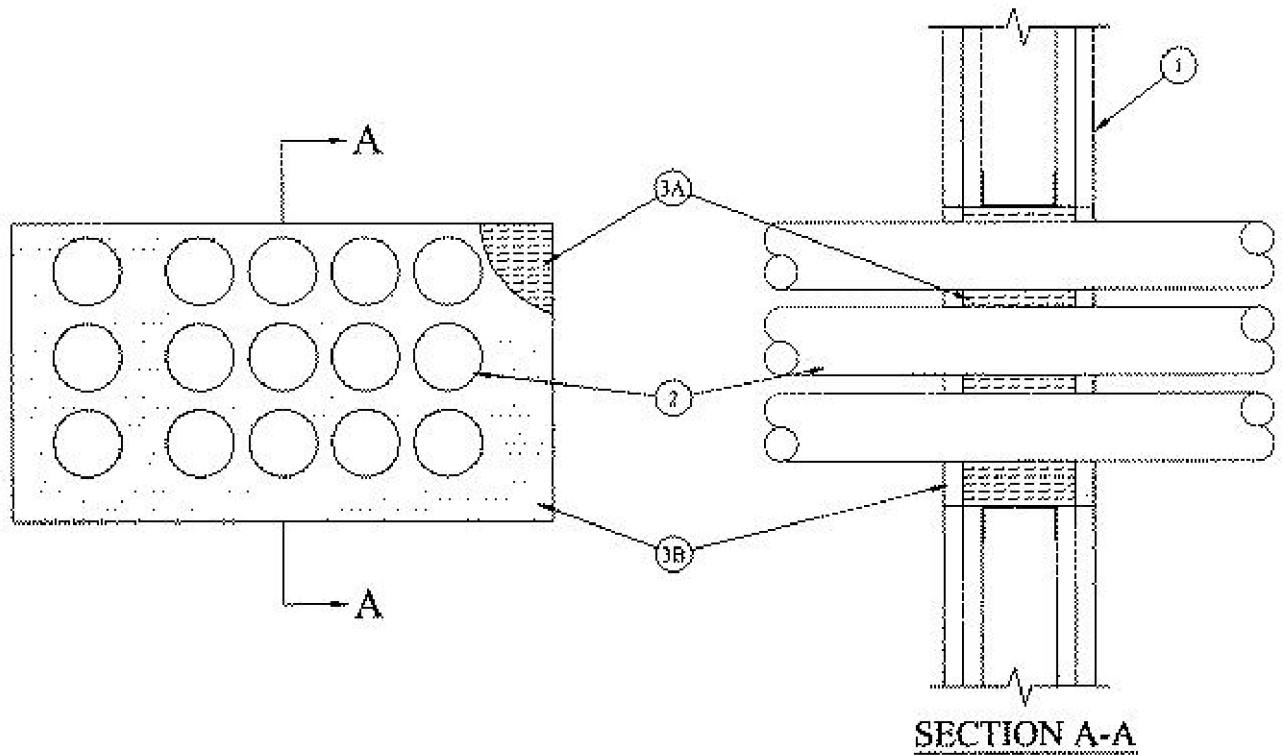
See General Information for Through-penetration Firestop Systems

System No. W-L-1176

July 08, 2003

F Ratings — 1 and 2 Hr (See Items 1 and 3A)

T Rating — 1/2 Hr



1. **Wall Assembly** — The 1 or 2 hr fire rated wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.

A. **Studs** — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.

B. **Gypsum Board*** — The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max area of opening is 180 sq. in. with max dimension of 18 in. Max width of openings in wood stud walls is limited 16-1/2 in.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrant** — One or more steel electrical metallic tubing to be installed within the opening. The space between tubing shall be min 1/2 in. and max 5/8 in. Tubing may be installed at an angle not greater than 45 degrees from perpendicular. Tubing to be rigidly supported on both sides of wall assembly. The space between tubing and periphery of opening shall be min 1/2 in. to max 2-3/8 in. The following types and sizes of metallic tube may be used:

A. **Conduit** — Nom 2 in. diam (or smaller) steel electrical metallic tubing or 2 in. diam steel conduit.

3. **Firestop System** — The firestop system shall consist of the following:

A. **Packing Material** — Min 2-1/2 or 3-3/4 in. thickness of min 4 pc mineral wool batt insulation, firmly packed into the opening as a permanent form for 1 or 2 hr rated walls, respectively. Mineral wool to be recessed from both sides of the assembly to accommodate the required thickness of fill material (Item 3B).

B. **Fill, Void or Cavity Material*** — Sealant — Min 5/8 in. thickness of fill material applied within the annulus, flush with both surfaces of wall.

HILTI INC — FS-ONE Sealant

*Bearing the UL Classification Mark

Last Updated on 2003-07-08

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XHEZ.W-L-1297
Through-penetration Firestop Systems

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Design/System/Construction/Assembly Usage Disclaimer

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- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems

System No. W-L-1297

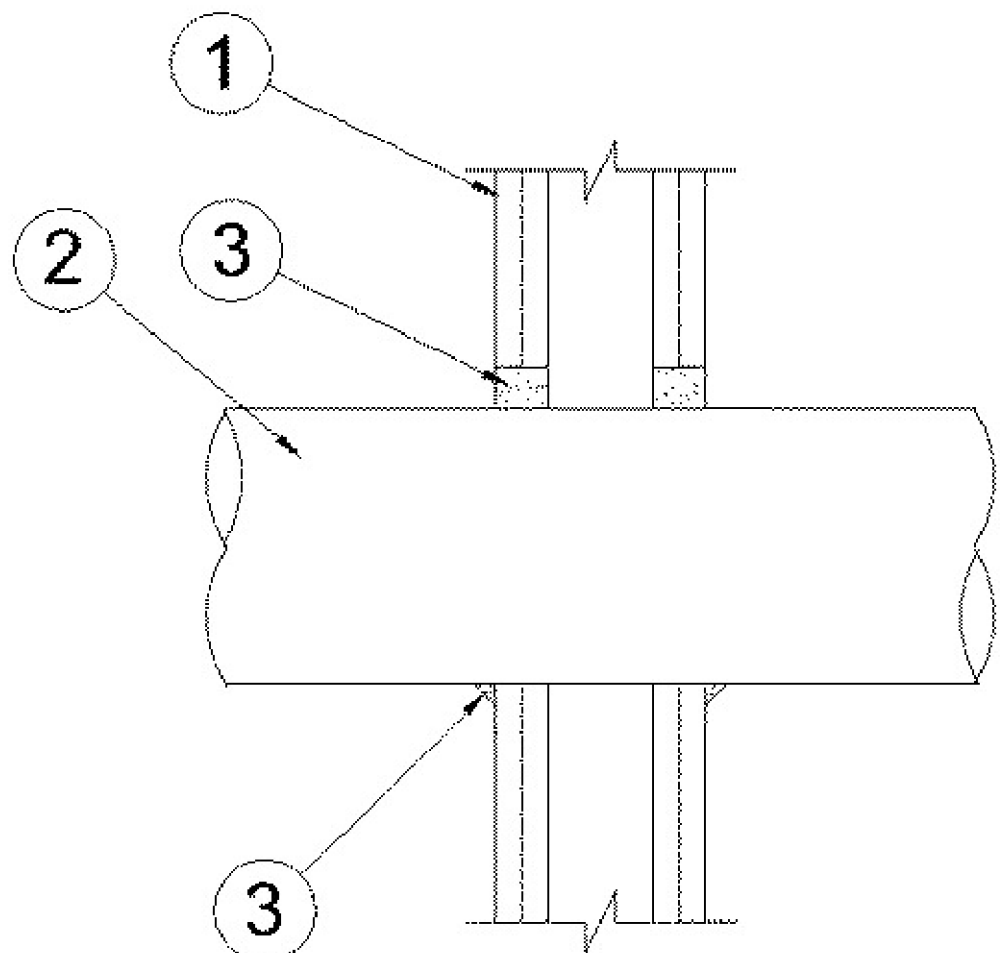
June 03, 2005

F Ratings — 1 and 2 Hr (See Item 1)

T Rating — 0 Hr

L Rating at Ambient — Less than 1 CFM/Sq Ft

L Rating at 400° F — Less than 1 CFM/Sq Ft



1. **Wall Assembly** — The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.

A. **Studs** — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.

B. **Gypsum Board*** — Nom 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the Fire Resistance Directory. Max diam

of opening is 32 in. (813 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrant** — One metallic pipe, conduit or tubing installed concentrically or eccentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. Pipe, conduit or tube to be rigidly supported on both sides of wall assembly. The annular space between the pipe, conduit or tube and periphery of the opening shall be min 0 in (0 mm, point contact) to max 2 in. (51 mm) in 2 hr fire rated walls and min 0 in (0 mm, point contact) to max 1 in. (25 mm) in 1 hr fire rated walls. The following types and sizes of metallic pipes, conduit or tube may be used:

A. **Steel Pipe** — Nom 30 in. (762 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.

B. **Iron Pipe** — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.

C. **Conduit** — steel conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or 6 in. diam

D. **Copper Tube** — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tube.

E. **Copper Pipe** — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. **Fill, Void or Cavity Material*** — Sealant — Min 5/8 in. (16 mm) or 1-1/4 in. (32 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall, for 1 hr and 2 hr fire rated wall assemblies, respectively. A min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/wall interface at the point contact location.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP606 Flexible Firestop Sealant

*Bearing the UL Classification Mark

Last Updated on 2005-06-03

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System No. W-L-5047
XHEZ.W-L-5047
Through-penetration Firestop Systems

Page Bottom

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

Through-penetration Firestop Systems

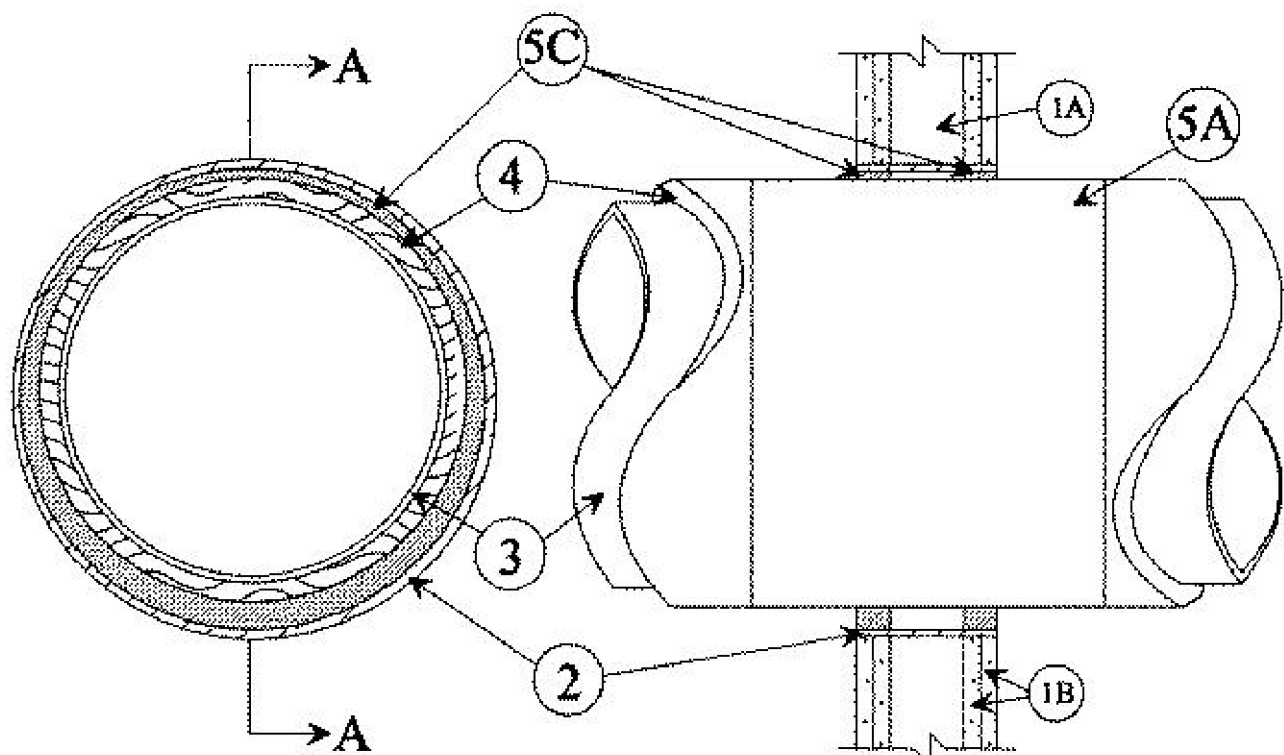
See General Information for Through-penetration Firestop Systems

System No. W-L-5047

February 08, 2006

F Ratings — 1 & 2 Hr (See Item 1)

T Rating — 0 & 1-1/2 Hr (See Item 1)



1. **Wall Assembly** — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.

A. **Studs** — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. When steel studs are used and the diam of opening exceeds the width of the stud cavity, the opening shall be framed on all sides using lengths of studs installed between the vertical studs and attached to the studs at each end. The framed opening in the wall shall be 4 to 6 in. wider and 4 to 6 in. higher than the diam of the metallic sleeve (Item 2) such that a clearance of 2 to 3 in. is present between the sleeve and the framing on all four sides.

B. **Gypsum Board*** — Two layers of nom 5/8 in. thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 14-1/2 in. for wood stud walls and 30 in. for steel stud walls.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. The T Rating is 0 hr when installed in 1 hr wall assembly or when optional metallic sleeve (Item 2) is used. The T Rating is 1-1/2 hr when installed in 2

hr wall assembly and optional sleeve is not used.

2. **Metallic Sleeve (Optional)** — Nom 30 in. diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and insulated flush with wall surfaces.

3. **Through Penetrants** — One metallic pipe or tubing to be positioned within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:

A. **Steel Pipe** — Nom 20 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe** — Nom 20 in. diam (or smaller) cast or ductile iron pipe.

C. **Copper Tubing** — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.

D. **Copper Pipe** — Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.

4. **Pipe Covering*** — 1 to 3 in. thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners of factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. Pipe covering to terminate 6 in. from each side of the assembly.

5. **Firestop System** — The firestop system shall consist of the following:

A. **Pipe Covering Materials*** — Nom 1 to 3 in. thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube and extending 6 in. beyond each surface of the wall assembly. Pipe insulation secured with min 18 AWG steel wire 3 in. beyond each surface of the wall assembly. When steel sleeve is not used, the annular space shall be min 1/4 in. to max 3 in., or when sleeve is used, min 1 in. to max 2-1/4 in.

1IG MINWOOL L L C — High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation ThermoLoc

B. **Sheathing Material*** — All service jacket material shall be wrapped around the outer circumference of the pipe covering material (Item 4A) with kraft side exposed. Longitudinal joints sealed with metal fasteners or self-sealing lap tape.

See **Sheathing Material** (PVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

C. **Fill, Void or Cavity Material*** — Sealant — Min 5/8 in. or 1-1/4 in. thickness of fill material applied within the annulus flush with both surfaces of wall, for 1 or 2 hr walls, respectively.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant

*Bearing the UL Classification Mark

Last Updated on 2006-02-08

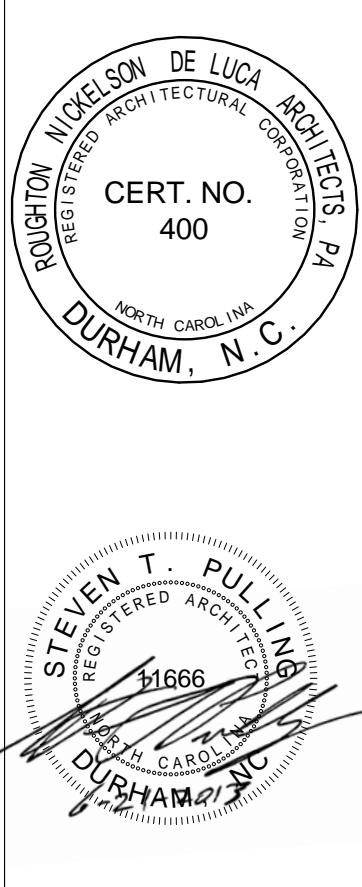
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Construction Documents

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REV.	DESCRIPTION	DATE

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Chief of Service:	Date:
Chief of Engineering:	Date:
Associate Director:	Date:
Director:	Date:
Chief of Staff:	Date:
Inspection Control:	Date:
Chief of Police:	Date:
Emergency Management:	Date:
Privacy Officer:	Date:

Drawing No. **UL Through-Penetration Firestop Systems**

Approved Chief Engineering Inc. Date:

APPROVED BY: Date:

MEDICAL CENTER DIRECTOR

Replace Boiler Plant Generator

Building No.	Designed by	Drawn by	Checked by
7 & 9	GDL/STP	STP	STP

Up to: **VAMC - Durham**
508 Fulton Street
Durham, North Carolina

Date: 21 June 2013

Project No. 558-11-102FCA

Project ID No. 13-E-07

DRAWING NO. **G006**

Sheet of

Department of VETERANS AFFAIRS

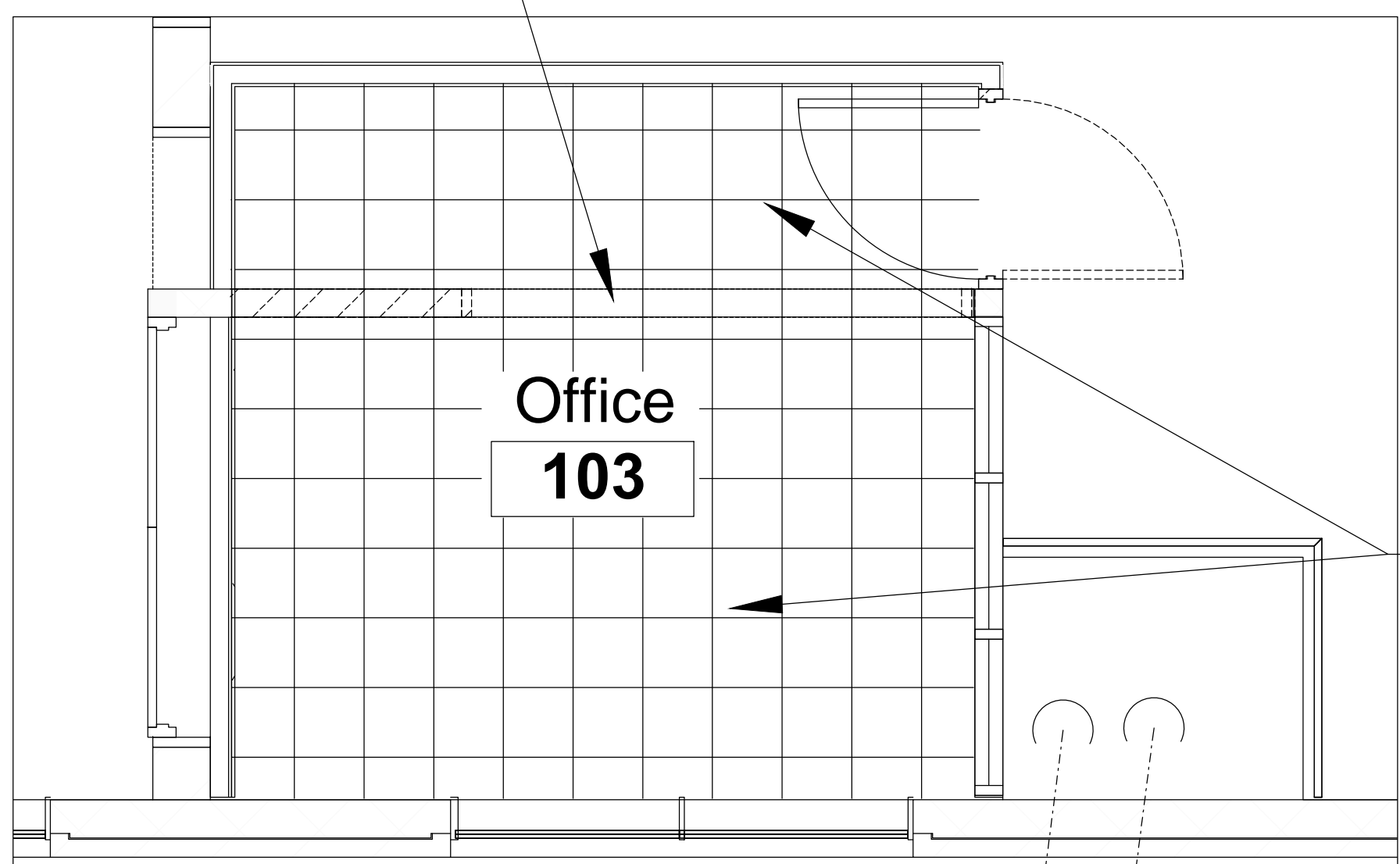


BUILDING No. 9 FIRST FLOOR

APPROXIMATE QUANTITIES OF ASBESTOS-CONTAINING MATERIALS

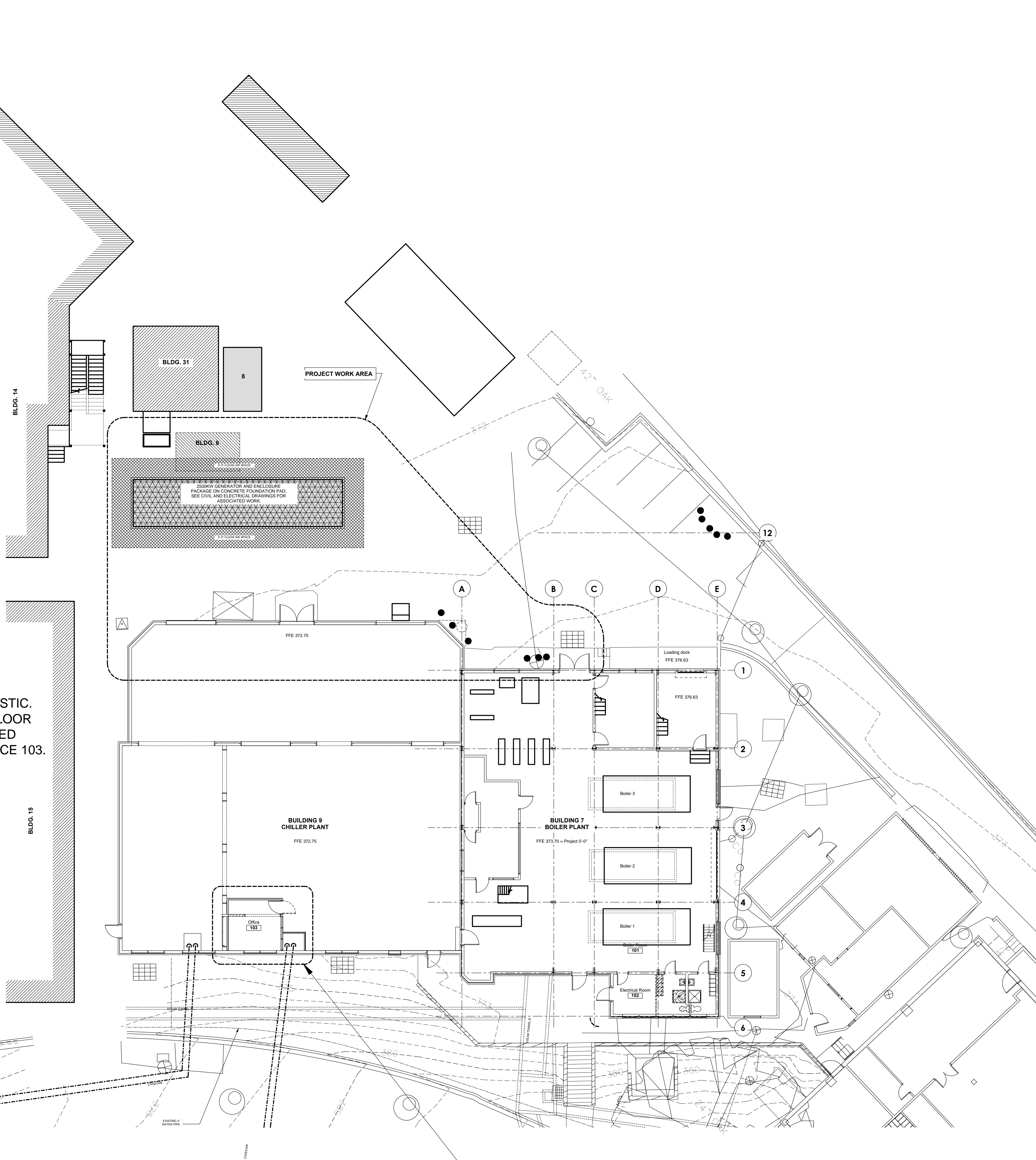
ROOM NO.	ROOM DESCRIPTION	FLOOR TILE /MASTIC SQ. FT.	WALLBOARD/JOINT COMPOUND SQ. FT.
—	OFFICE	88 *	252 *

ASBESTOS CONTAINING
WALLBOARD/JOINT COMPOUND.
REMOVE ALL WALLBOARD/JOINT
COMPOUND IN OFFICE 103.



AREA OF DETAIL
SCALE: 1" = 30"

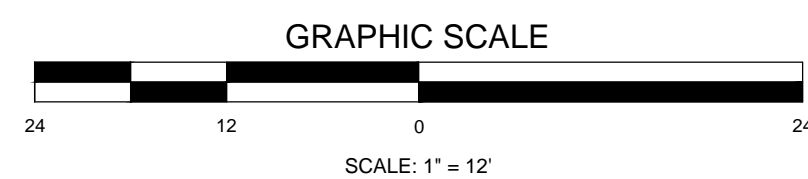
ASBESTOS
CONTAINING
FLOOR TILE/MASTIC.
REMOVE ALL FLOOR
TILE/ASSOCIATED
MASTIC IN OFFICE 103.



ASBESTOS ABATEMENT AREA
(SEE AREA OF DETAIL)

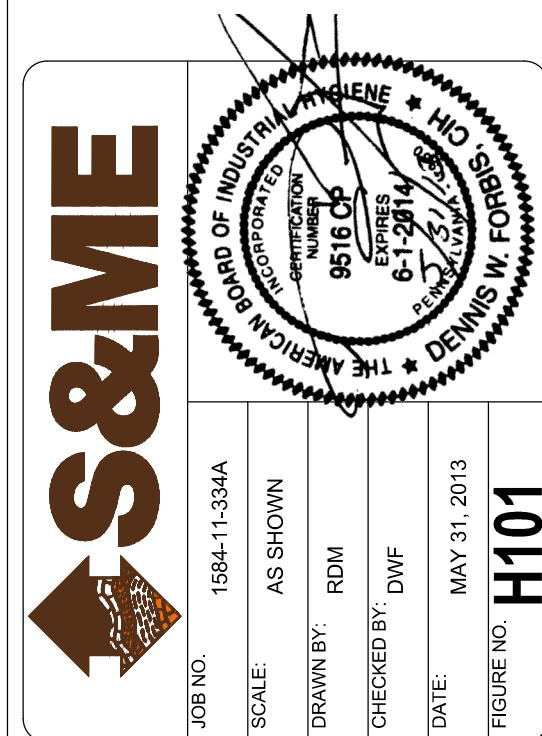
Areas of known asbestos containing materials in renovation scope *per the Reinspection for Asbestos-Containing Materials, Building No. 9, Department of Veterans Affairs, VA Medical Center, Durham, North Carolina Matrix Job No. 111106*, dated February 14, 2012 prepared by Matrix Health & Safety Consultants, L.L.C. (Matrix) of Raleigh, North Carolina, and provided by the VA Medical Center to RND Architects, PA and S&ME, Inc. for use with this project.

Coordinate the schedule, phasing and asbestos abatement operations with the contractor secured by the Veterans Administration to perform the overall Replace Boiler Plant Generator project. Observed all limitations with respect to access to VA facilities, placement and location of regulated areas, hours of operation and temporary storage and transport of asbestos waste with the VA representative. Remove all asbestos-containing floor tile/associated mastic and wallboard/joint compound indicated in the abatement area.



ROUGHTON • NICKELSON • DE LUCA
Architects, PA

8608 University Drive, Suite 204
Durham, NC 27707
T 919.490.1266 F 919.490.1396
www.RNDpa.com



Construction Documents

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Requestor:	Date:
Chief of Service:	Date:
Infection Control:	Date:
Chief of Staff:	Date:
Assoc. Med. Ch. Dir.:	Date:

Drawing Title:
Asbestos Abatement Plan

Approved Chief, Engineering Svc.	Date:
----------------------------------	-------

APPROVED BY:

MEDICAL CENTER DIRECTOR

Project Title: Replace Boiler Plant Generator

Building No.	Designed by:	Drawn by:	Checked by:
7 & 9	DWF	RDM	DWF

Location	VAMC - Durham
	508 Fulton Street
	Durham, North Carolina

Date	05-31-2013	f	RS
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Project No.	558-11-102FCA
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Project ID No.	13-E-07
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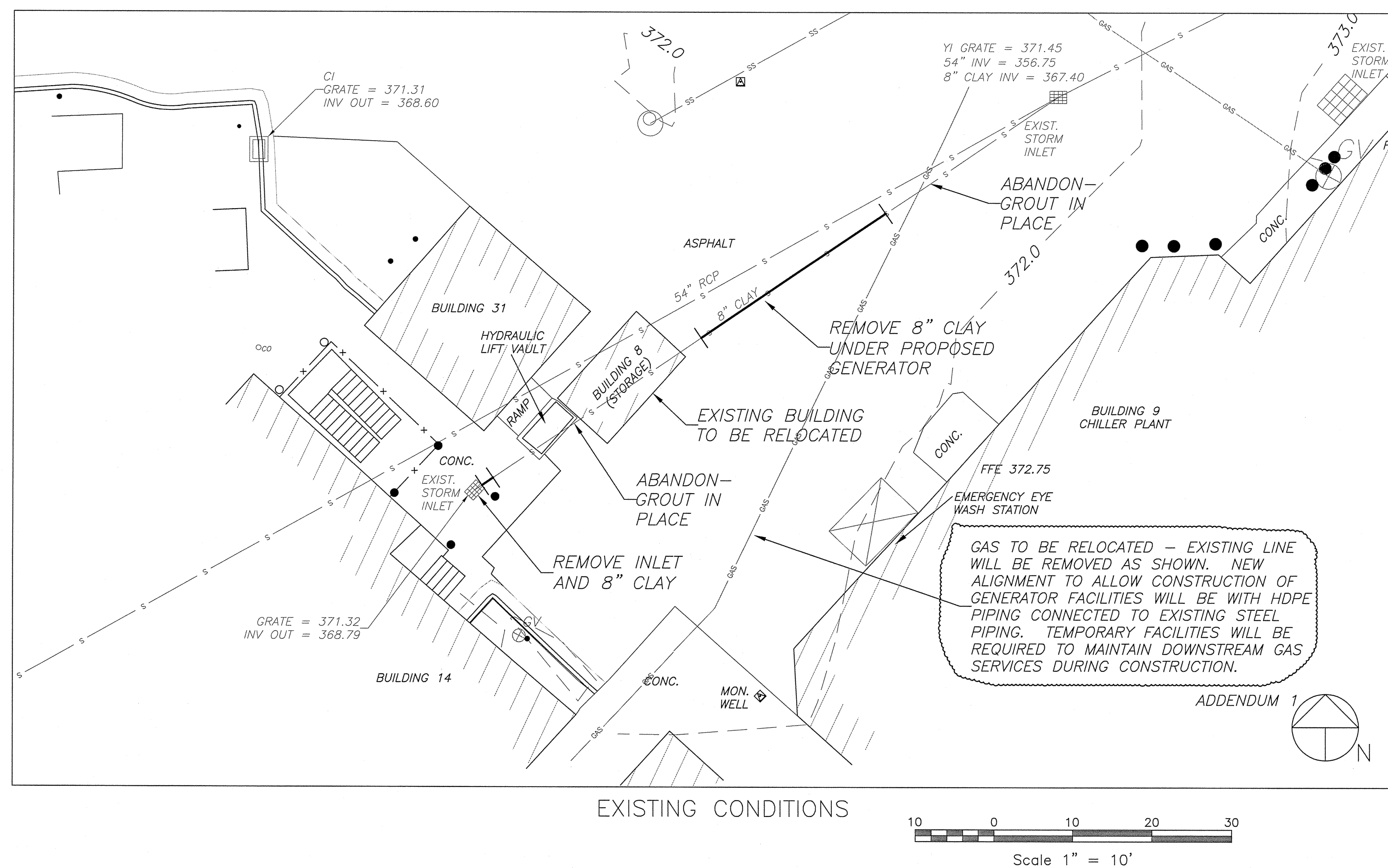
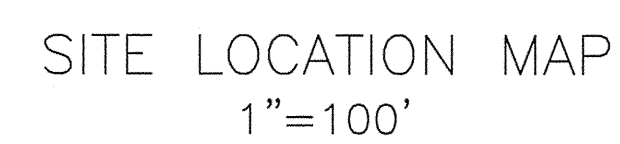
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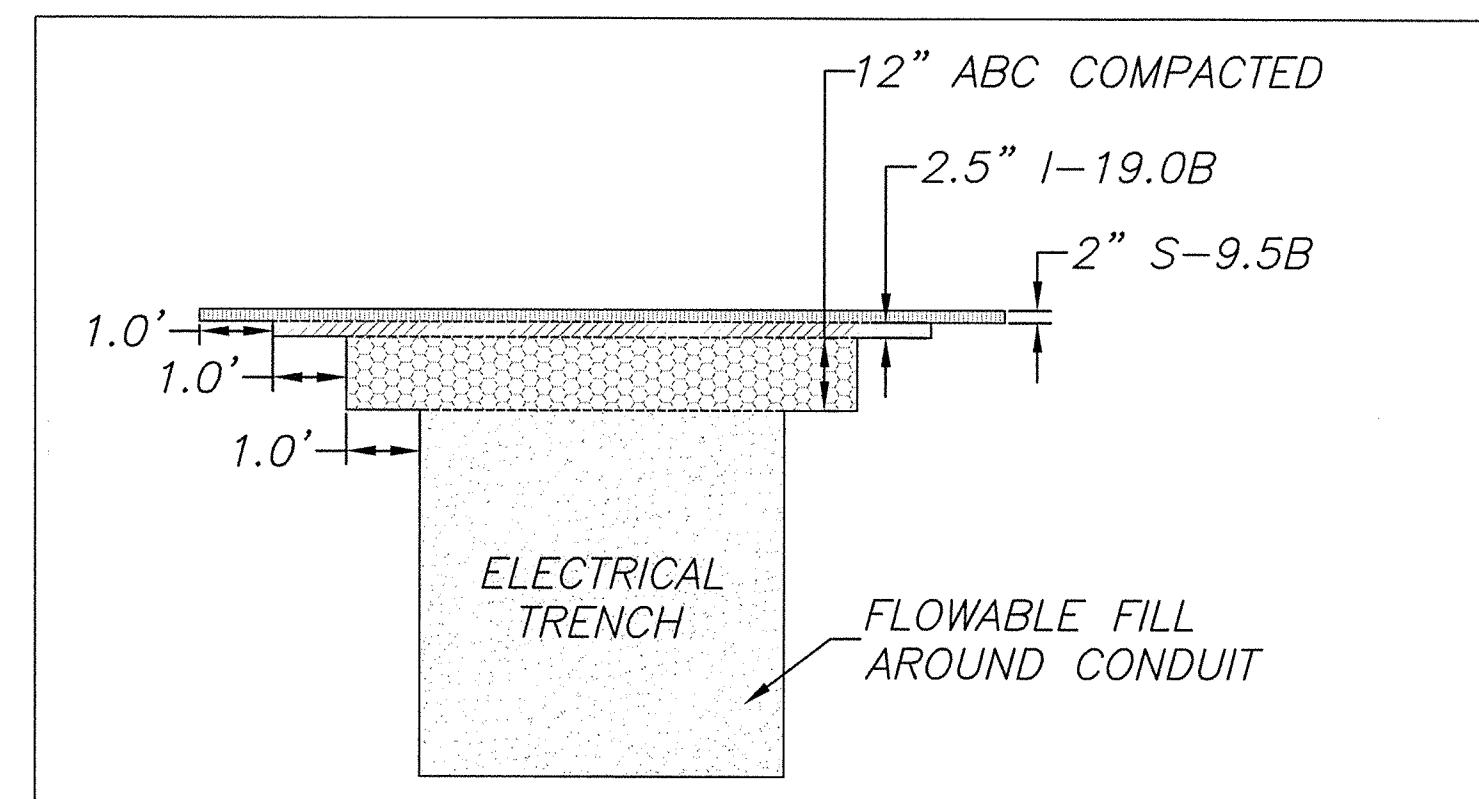
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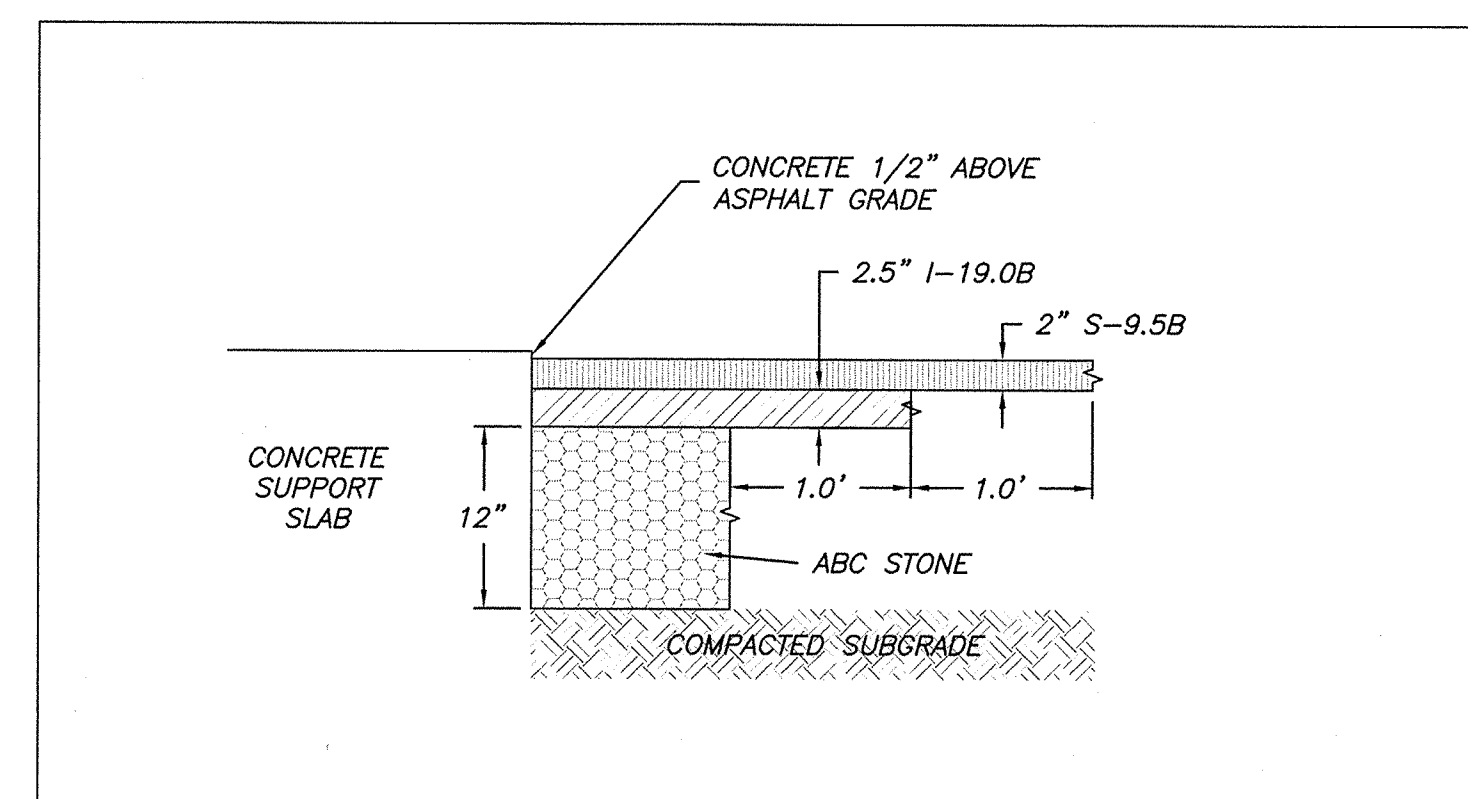


Department of
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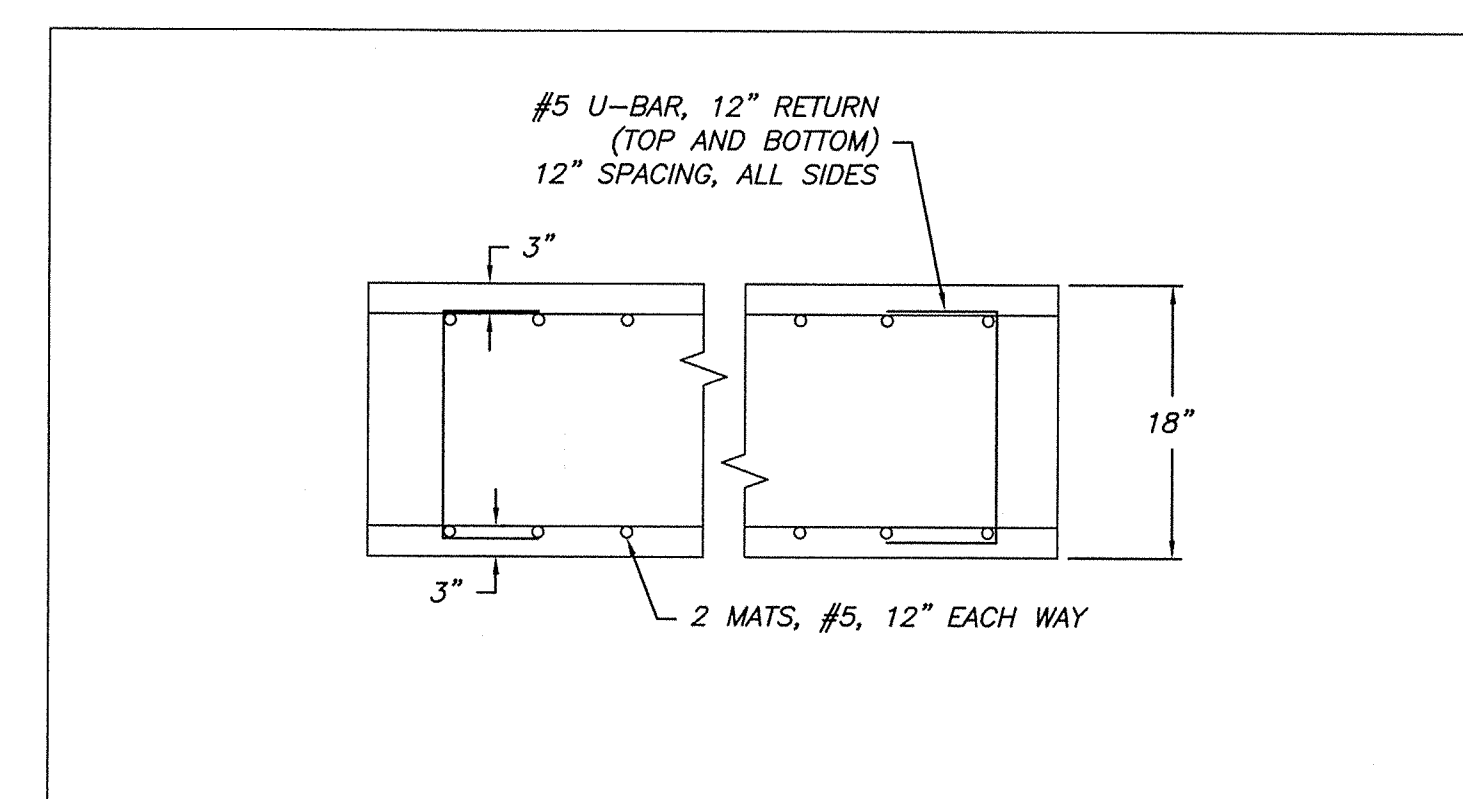
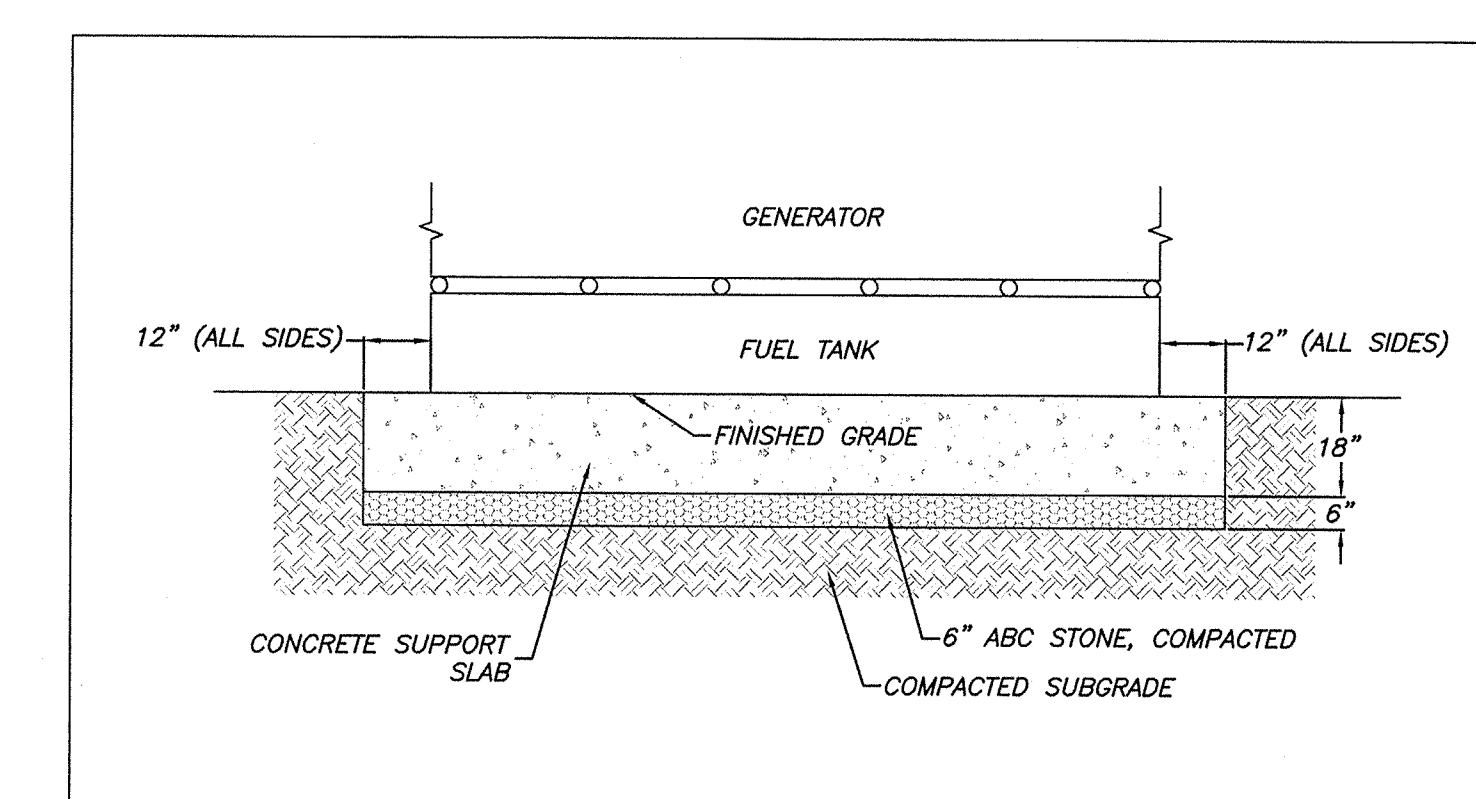




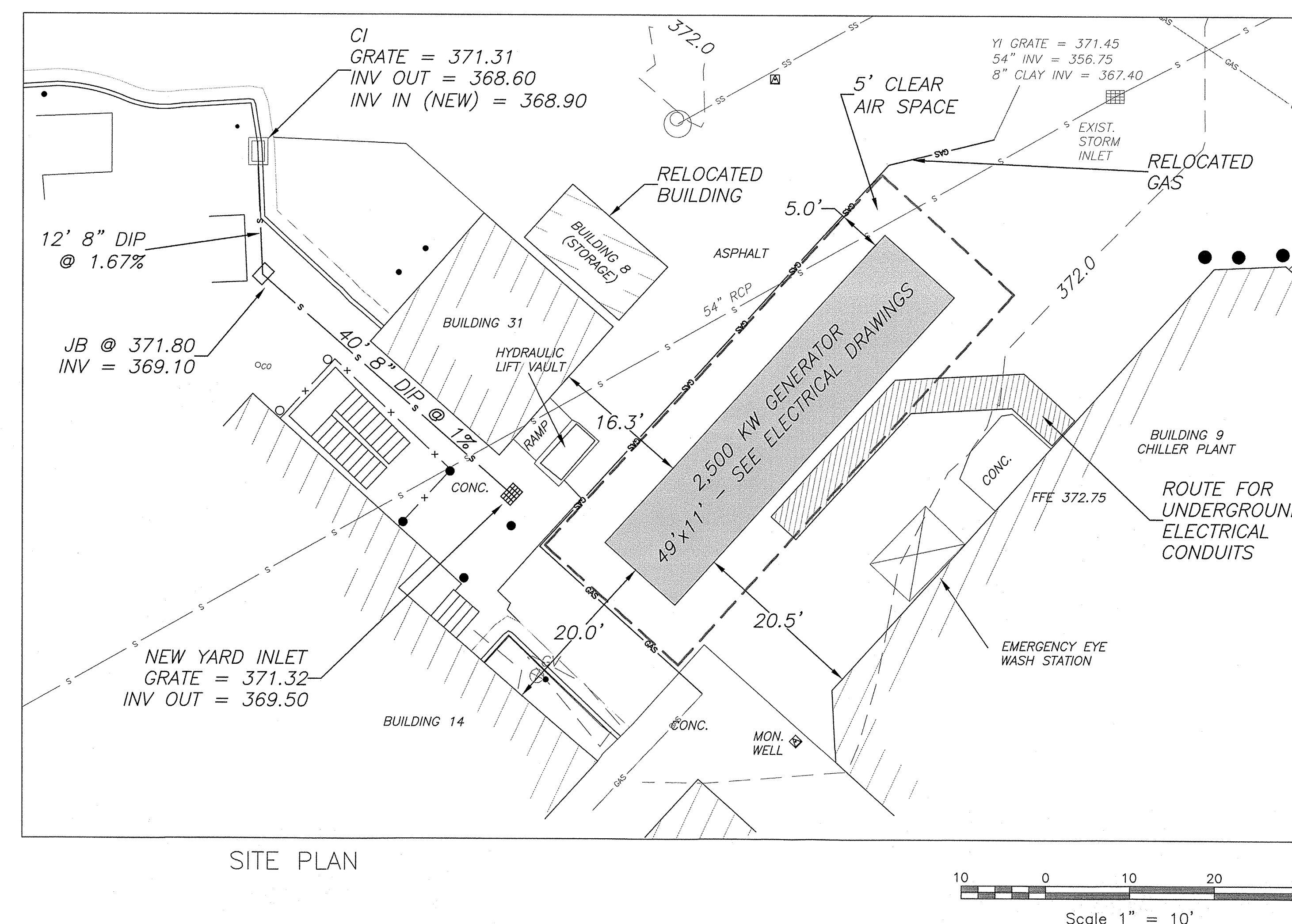
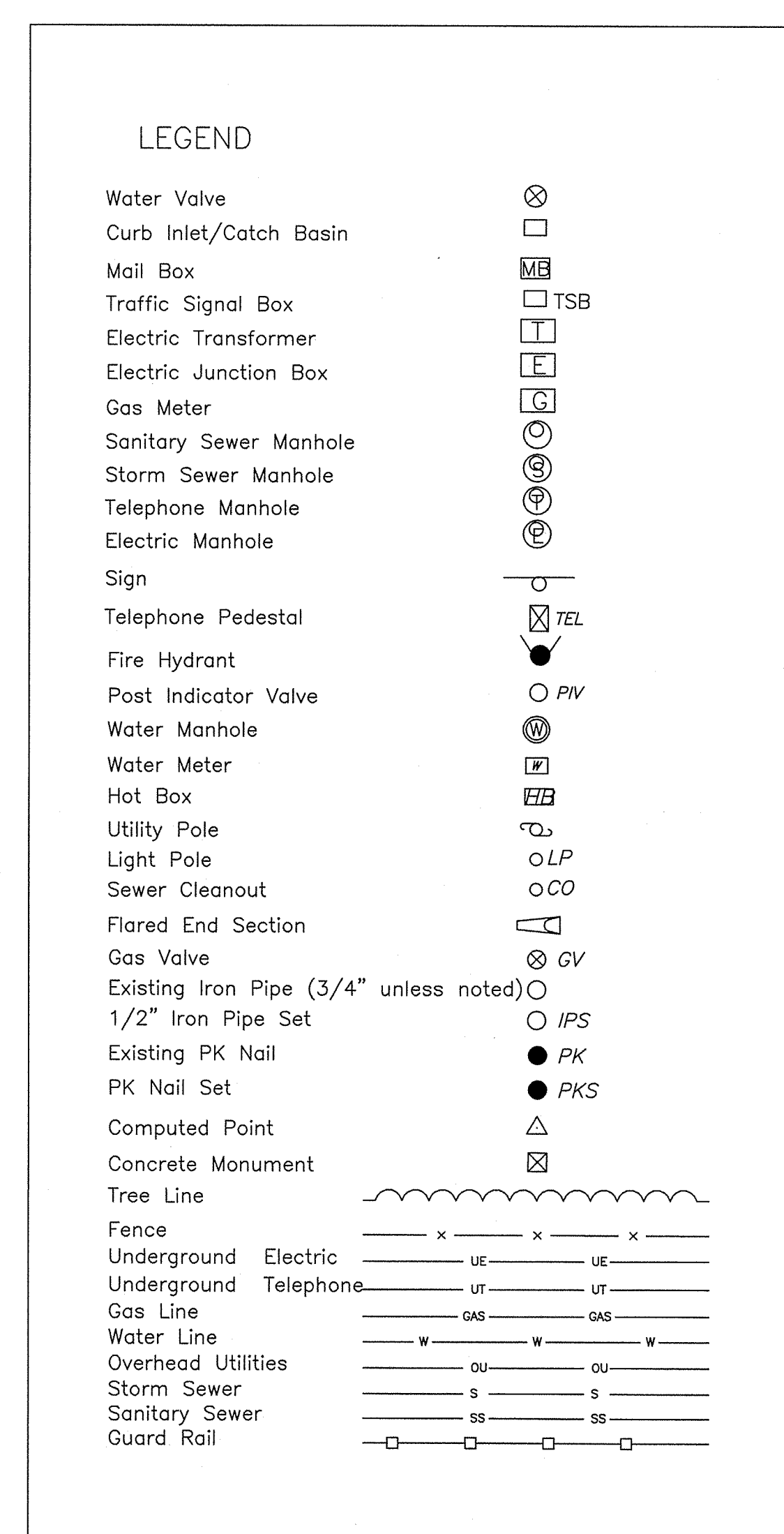
ELECTRICAL TRENCH DETAIL - NTS

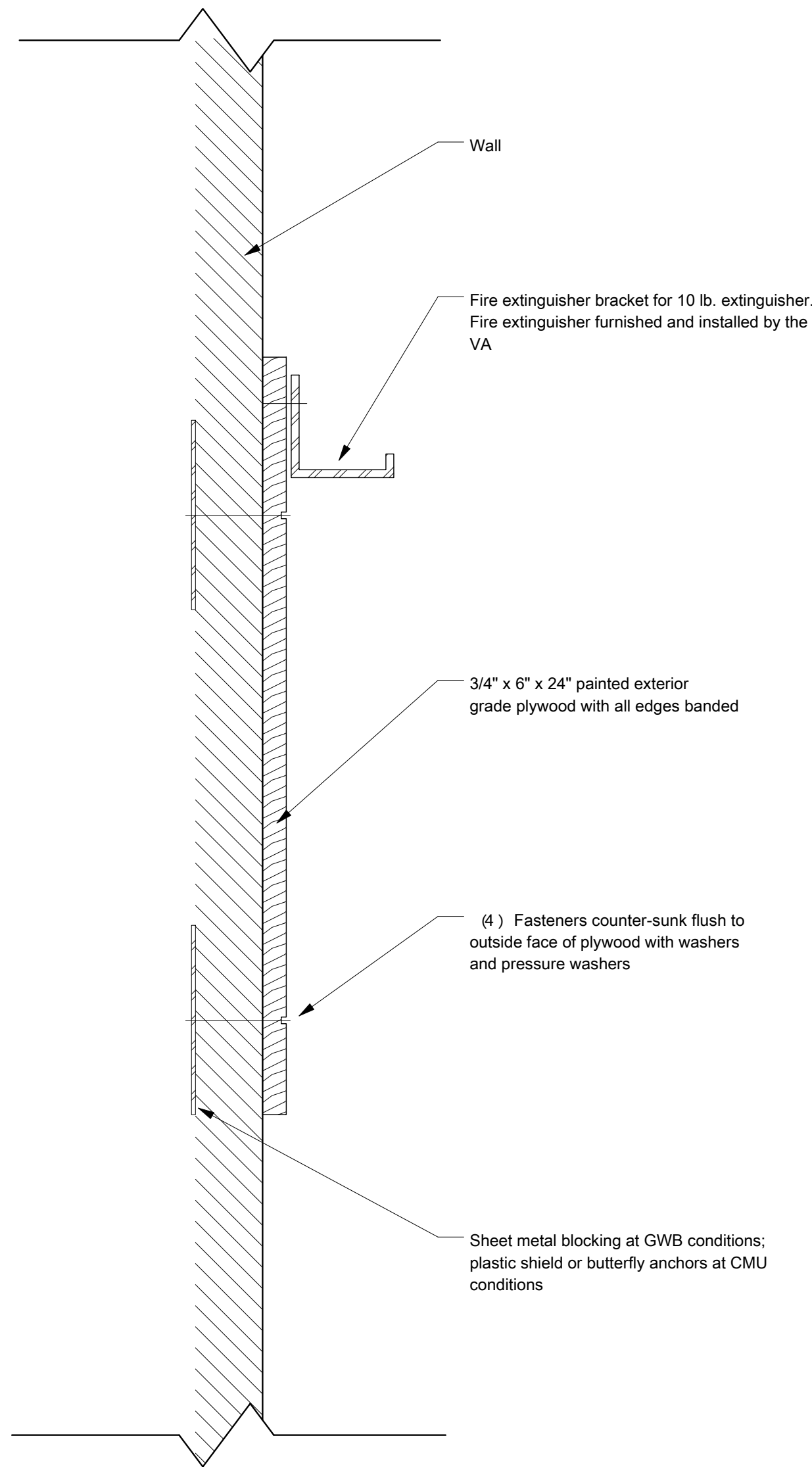


ASPHALT REPAIR – NTS

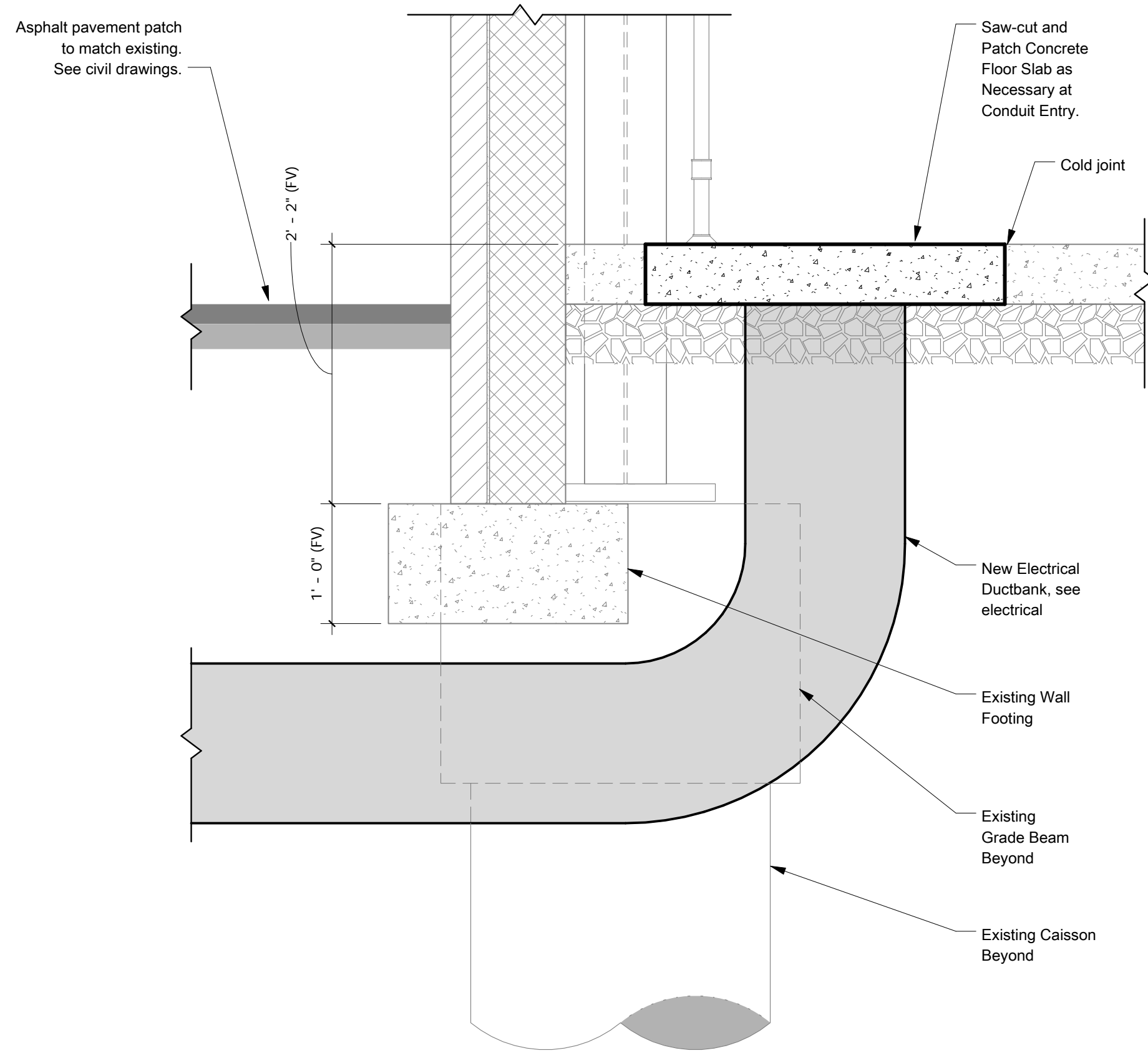
STEEL REINFORCEMENT FOR - NTS
CONCRETE SUPPORT SLAB

CONCRETE SUPPORT SLAB - NTS
FOR GENERATOR

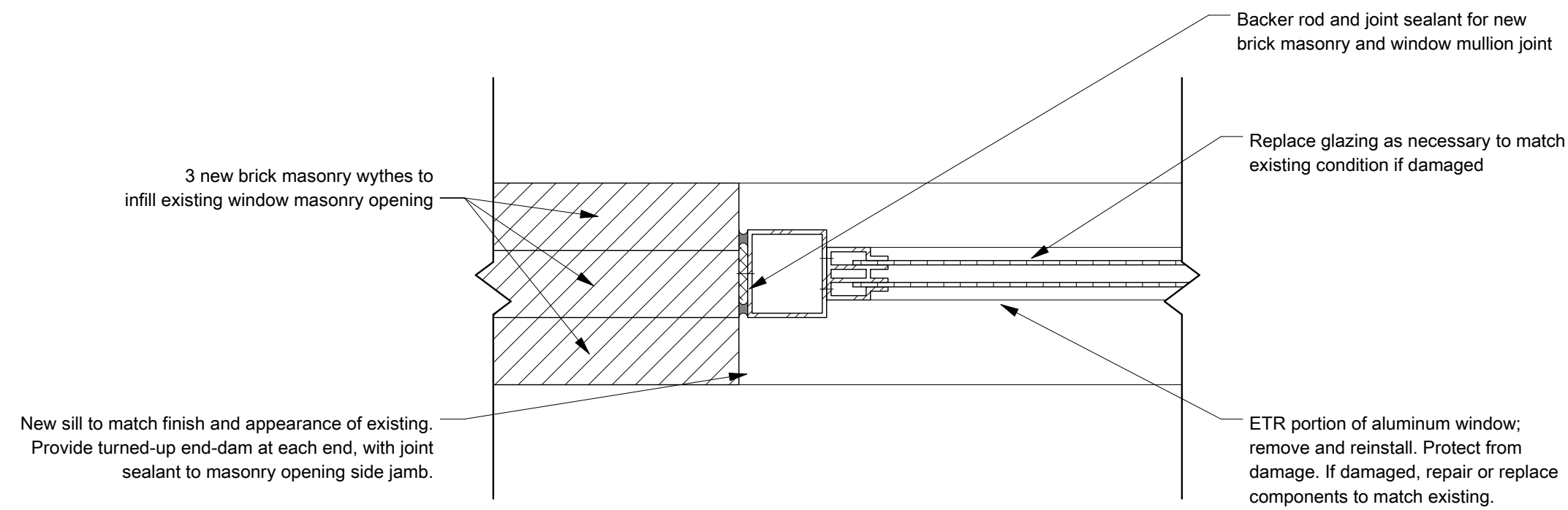




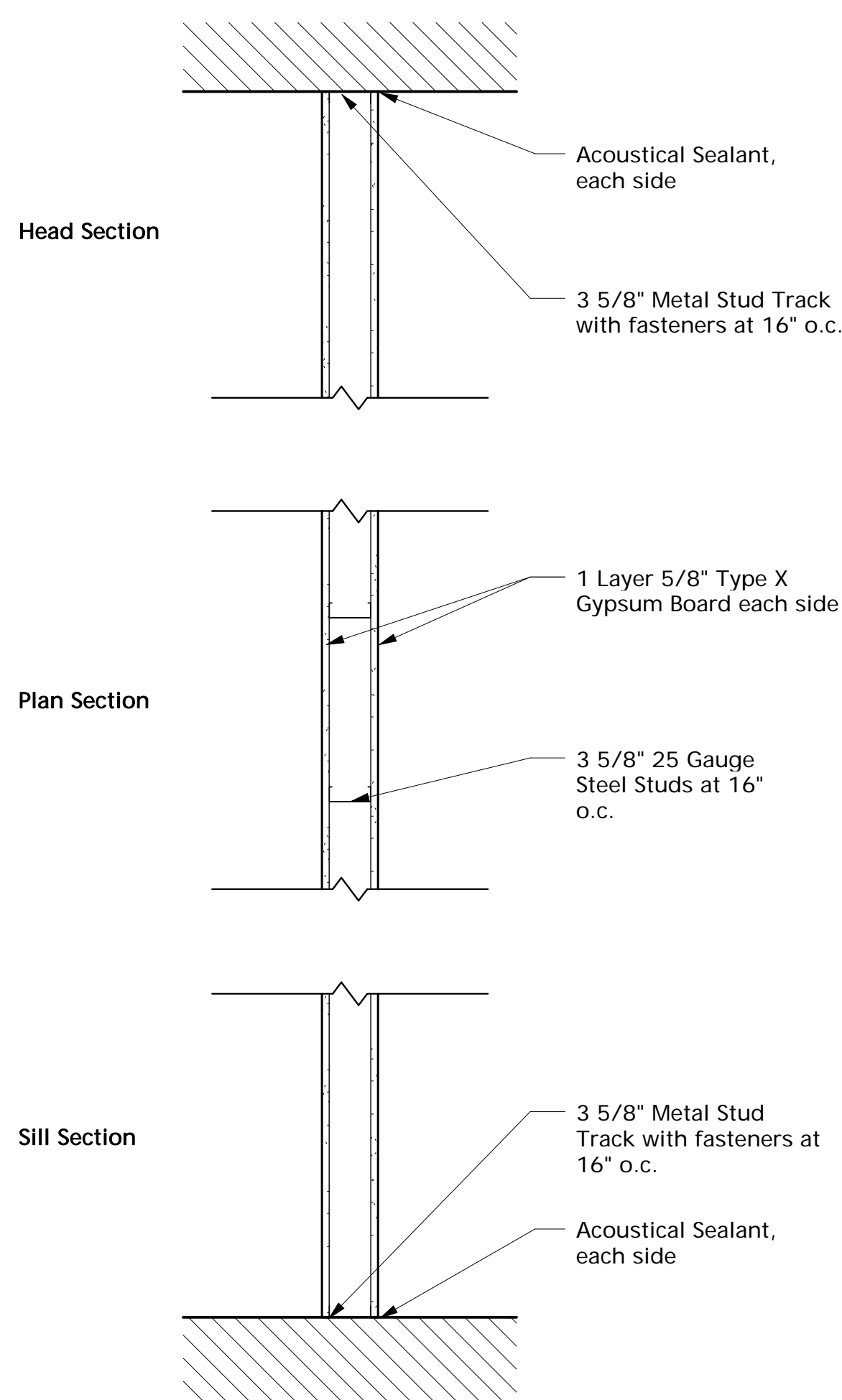
7 Fire Extinguisher Bracket Detail
3' = 1'-0"



6 Wall Footing At Ductbank Entry
1" = 1'-0"



5 Detail at Partial Window Infill
1 1/2" = 1'-0"



PROJECT AREA CONSTRUCTION SIDE
The project site must be contained completely with construction barriers. The barriers must consist of solid wall construction (4\"/>

8.6.2 Temporary Separation Walls

8.6.2.1 Protection shall be provided to separate an occupied portion of the structure from a portion of the structure undergoing alteration, construction, or demolition operations when such operations are considered as having a higher level of hazard than the occupied portion of the building.

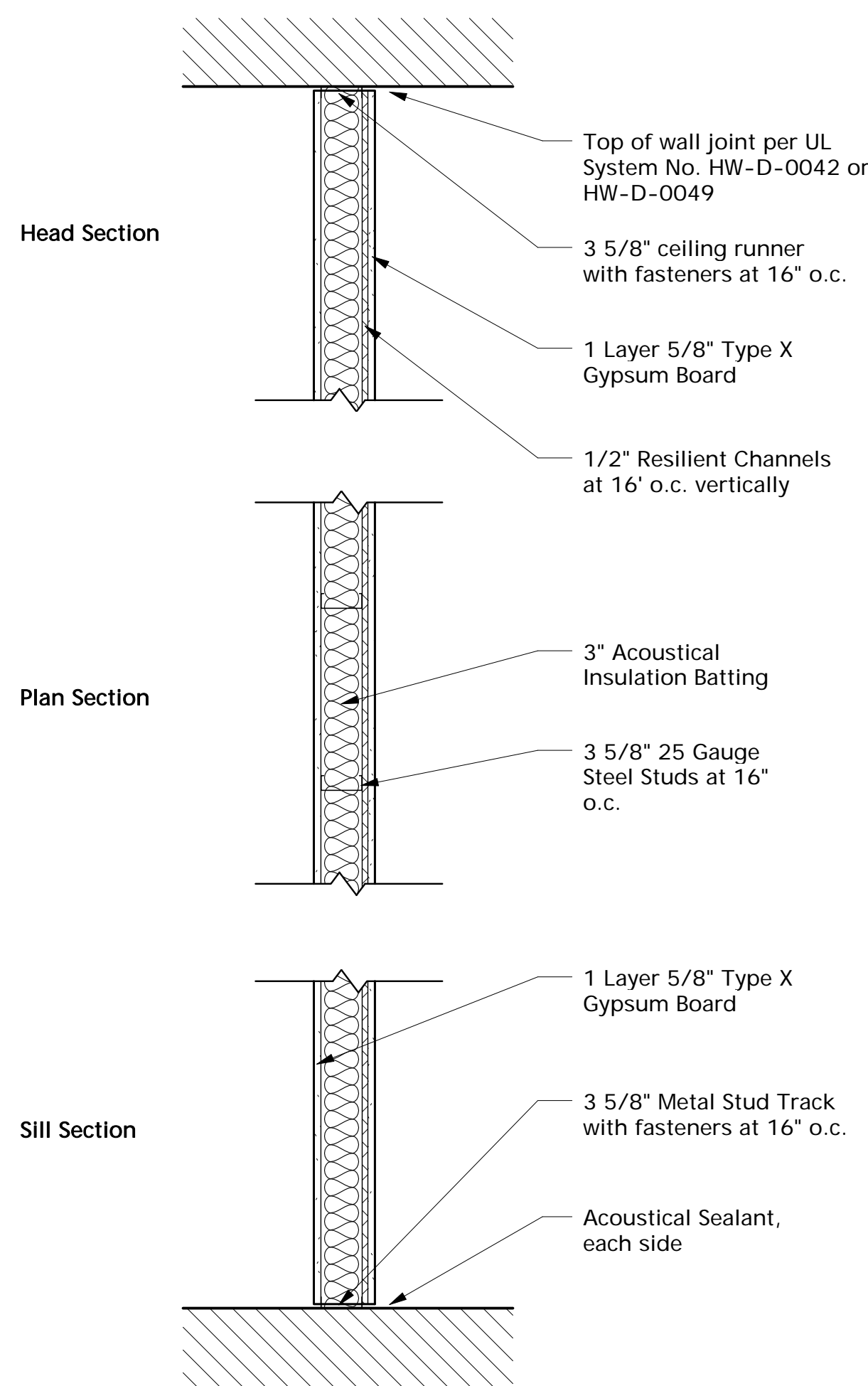
8.6.2.2 Walls shall have at least a 1-hour fire resistance rating.

8.6.2.3 Opening protectives shall have at least a 45-minute fire protection.

8.6.2.4 *Nonrated walls and opening protectives shall be permitted when an approved automatic sprinkler system is installed. (This only applies if sprinkler systems is maintained operational in both the non-construction and construction areas.)

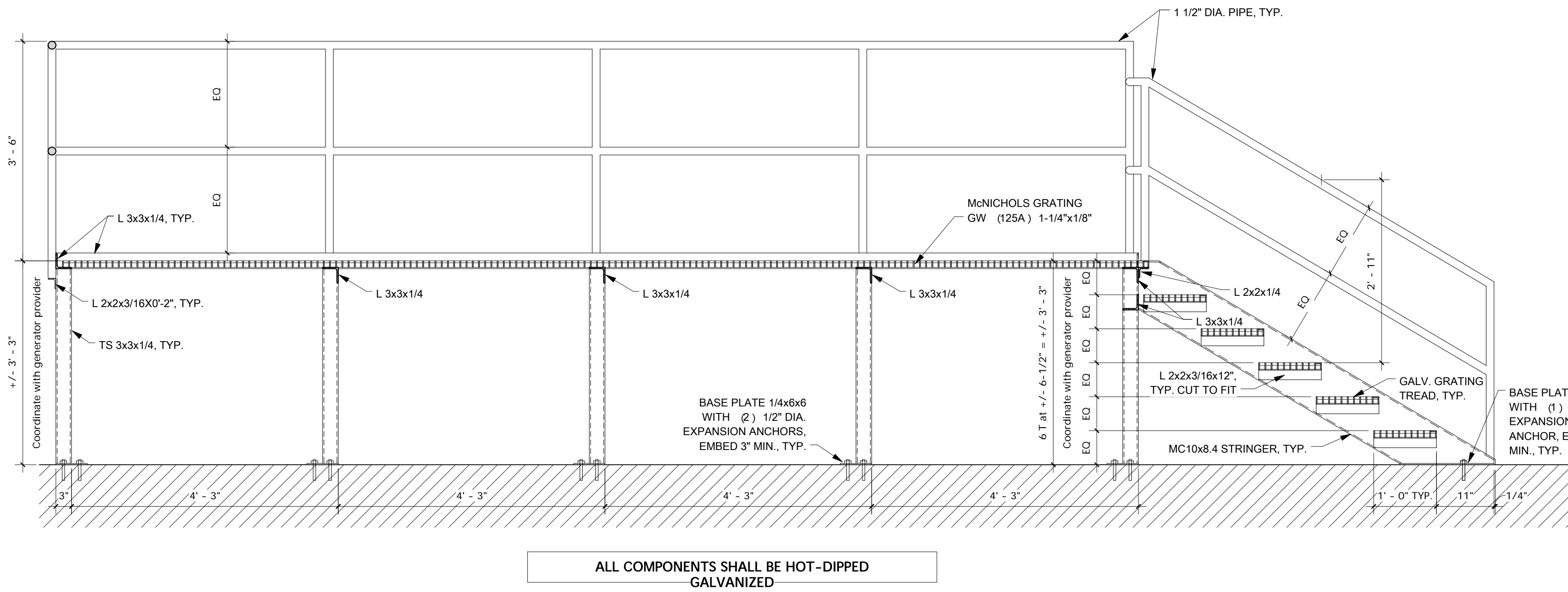
Dust Barrier Assembly
UL Design U425
4 7/8\"/>

4 Dust Barrier Assembly Detail
1" = 1'-0"

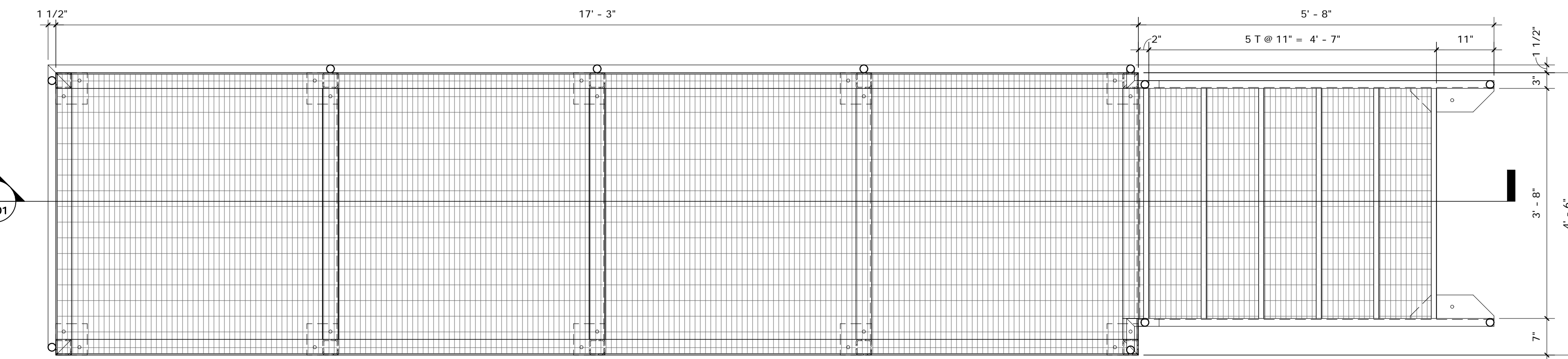


Fire & Sound Assembly Detail
UL Design U419
1 Hour Fire Rating
54 STC minimum
5-3/8\"/>

3 Partition Type A
1" = 1'-0"

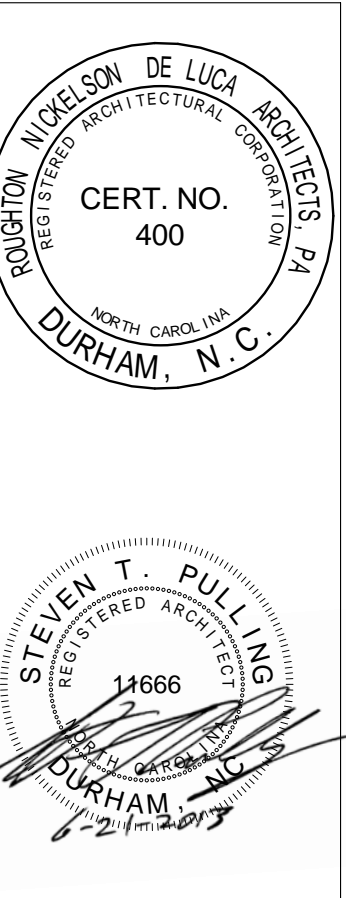


2 Generator Access Stair and Platform - Section
3/4\"/>



1 Generator Access Stair and Platform - Plan View
3/4\"/>

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Architects, PA



Construction Documents

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REV.	DESCRIPTION	DATE

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Chief of Engineering:	Date:
Associate Director:	Date:
Director:	Date:
Chief of Staff:	Date:
Injection Control:	Date:
Chief of Police:	Date:
Emergency Management:	Date:
Privacy Officer:	Date:

Details

Approved Chief, Engineering Inc. Date:

APPROVED BY: Date:

MEDICAL CENTER DIRECTOR

Replace Boiler Plant Generator

Building No. 7 & 9 Designed by GDL/STP Drawn by RS/STP Checked by STP/GDL

Location: VAMC - Durham 508 Fulton Street Durham, North Carolina

Date: 21 June 2013

Project No. 558-11-102FCA

Project ID No. 13-E-07

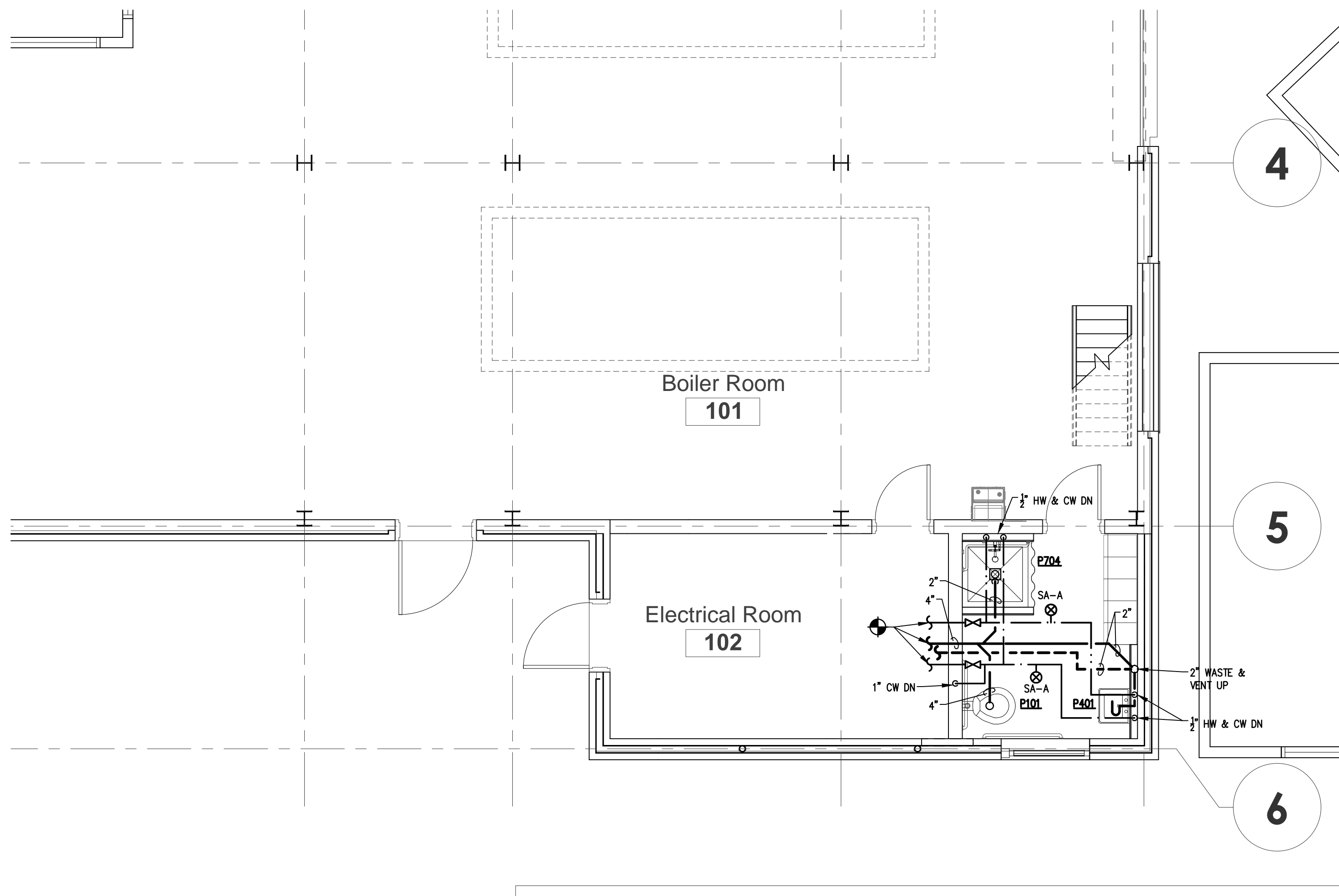
DRAWING NO.

A301












Sheet of

Department of VETERANS AFFAIRS

1 Plumbing Demolition Plan - Level 1
P101 SCALE: 1/4" = 1'-0"



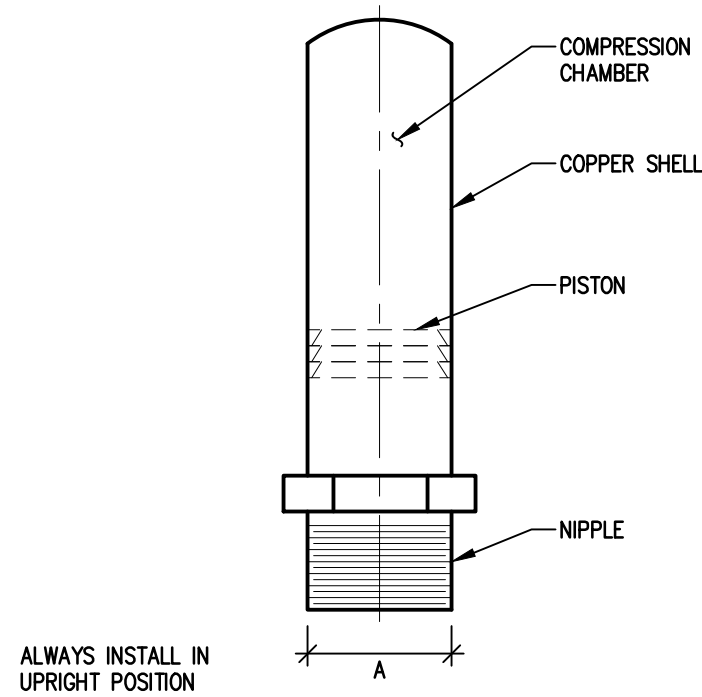
2 Plumbing Renovation Plan - Level 1
P101 SCALE: 1/4" = 1'-0"

PLUMBING LEGEND	
W	WASTE
V	VENT
HW	HOT WATER
CW	COLD WATER
	PLUMBING FIXTURE
	SANITARY SEWER PIPING
	VENT PIPING
	COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RECIRCULATING PIPING
	ELBOW UP
	ELBOW DOWN
	SERVICE VALVE
SA 	SHOCK ARRESTOR
	CONNECT TO EXISTING

FIXTURE SCHEDULE					
SYMBOL	FIXTURE	WASTE	CW	HW	REMARKS
P101	WATER CLOSET	4"	1"	-	FLOOR MOUNTED ADA
P401	LAVATORY	1-1/2"	1/2"	1/2"	WALL HUNG
P704	SHOWER	2"	1/2"	1/2"	

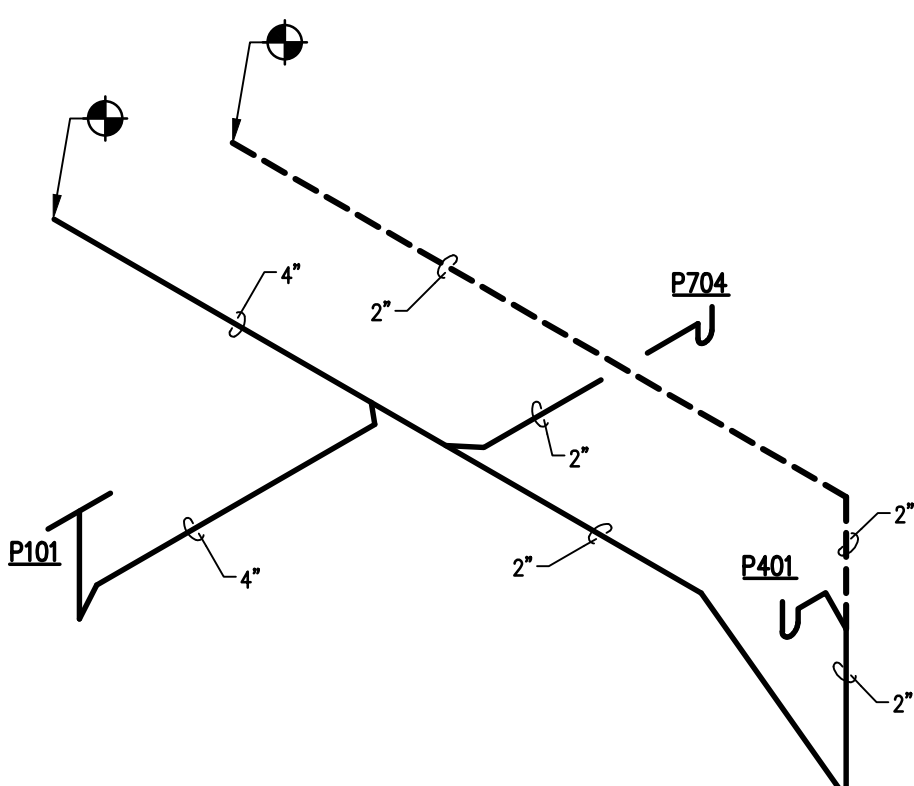
GENERAL PLUMBING DEMOLITION NOTES:

1. NO EXISTING PIPING SHALL BE LEFT OPEN AFTER PARTIAL REMOVAL.
2. ALL EXISTING FLOOR OPENINGS WHERE PIPE IS REMOVED SHALL BE PATCHED TO MATCH EXISTING FLOOR. MAINTAIN BLDG. FIRE RATING BY THE PC.
3. FIELD VERIFY ALL EXISTING PIPE LOCATIONS, SIZES, AND INVERTS. THIS IS TO INCLUDE ALL COLD, HOT, AND HOT WATER RETURN PIPING, DRAIN WASTE AND VENT PIPING.
4. ASSOCIATED PIPING INCLUDES DRAIN, WASTE, VENT, HOT, HOT WATER RETURN, AND COLD WATER LINES.
5. ALL LINES THAT ARE TO BE REMOVED SHALL BE CAPPED AT A MAIN LINE, RISERS AND STACKS.

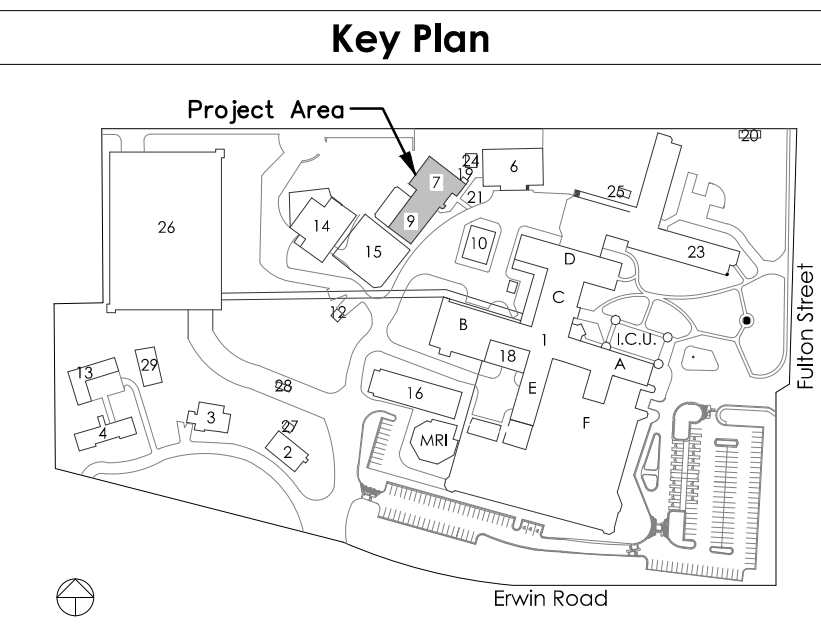


P.D.I. SYMBOL	FIXTURE UNIT RATING	A SIZE
A	1-11	1/2
B	12-32	3/4
C	33-60	1
D	61-113	1 1/4
E	114-154	1 1/2
F	155-330	2

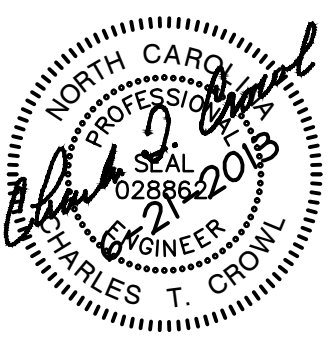
3 Shock Arrestor Schedule



4 Waste & Vent Riser Diagram



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Architects, PA



EDMONDSON ENGINEERS
1920 Hwy. 54, Suite 700, Durham, NC 27713
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Chief of Service:	Date:
Infection Control:	Date:
Requestor:	Date:
Chief of Staff:	Date:
Assoc. Med. Ctr. Dir.:	Date:

Drawing Title:
Plumbing Plans

Approved Chief, Engineering Svc.	Date:
----------------------------------	-------

APPROVED BY:

Project Title:
**Replace Boiler Plant
Generator**

Building No.	Designed by:	Drawn by:	Checked by:
7&9		WBF	CTC

VAMC - Durham
508 Fulton Street
Durham, North Carolina

Date	06-21-2013	of AIRS
Project No.	558 11 1025CA	

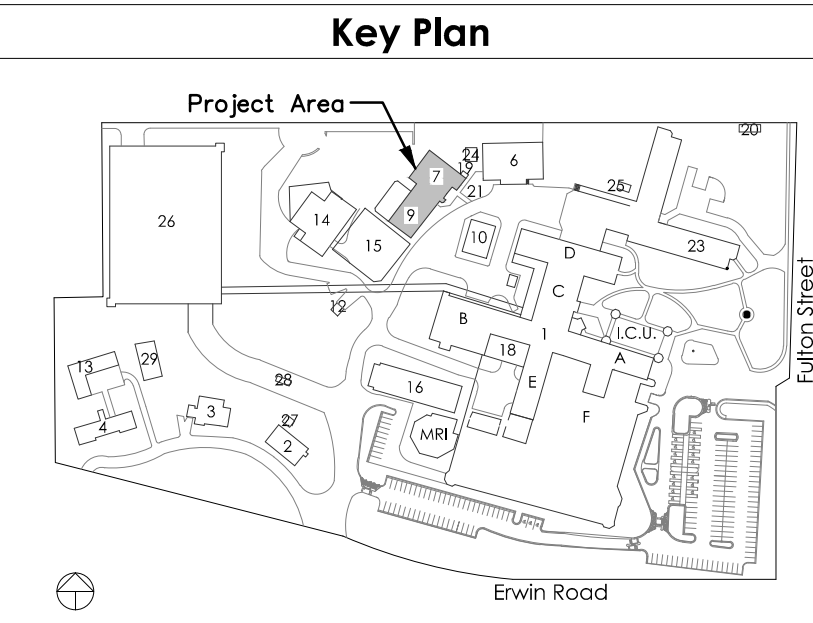
Project ID No. 13-E-07

DRAWING NO.

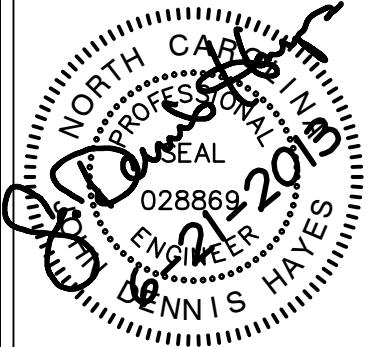
P101

Street of

Department of
VETERANS AFFAIRS



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Chief of Service:	Date:
Infection Control:	Date:
Requestor:	Date:
Chief of Staff:	Date:
Assoc. Med. Ctr. Dir.:	Date:

Electrical Renovation Plans

Approved Chief, Engineering Svc.	Date:
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MEDICAL CENTER DIRECTOR

Replace Boiler Plant Generator

Building No.	Designed by:	Drawn by:	Checked by:
7&9		CTW	JDH

Location	VAMC - Durham 508 Fulton Street Durham, North Carolina
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Date	06-21-2013	of FAIRS
Project No.	558-11-102FCA	

Project ID No.	13-E-07
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DRAWING NO.	part ERAN
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E201







E201 

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NOTES:

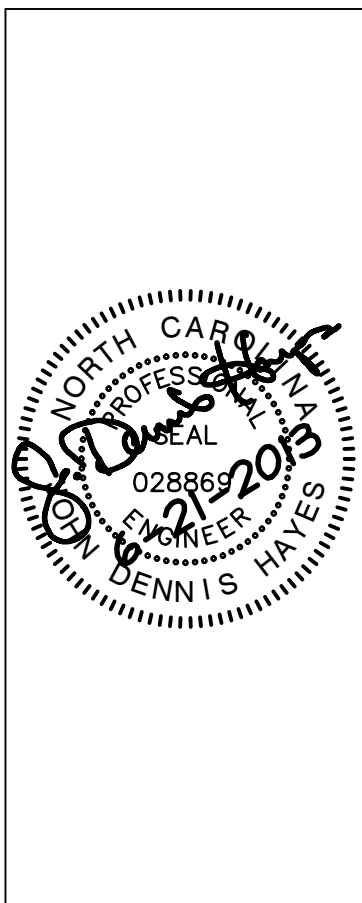
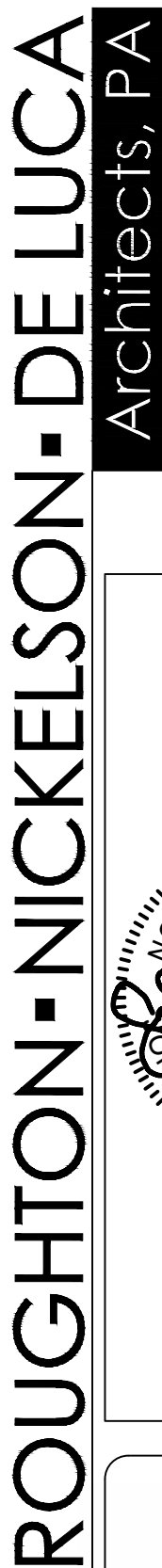
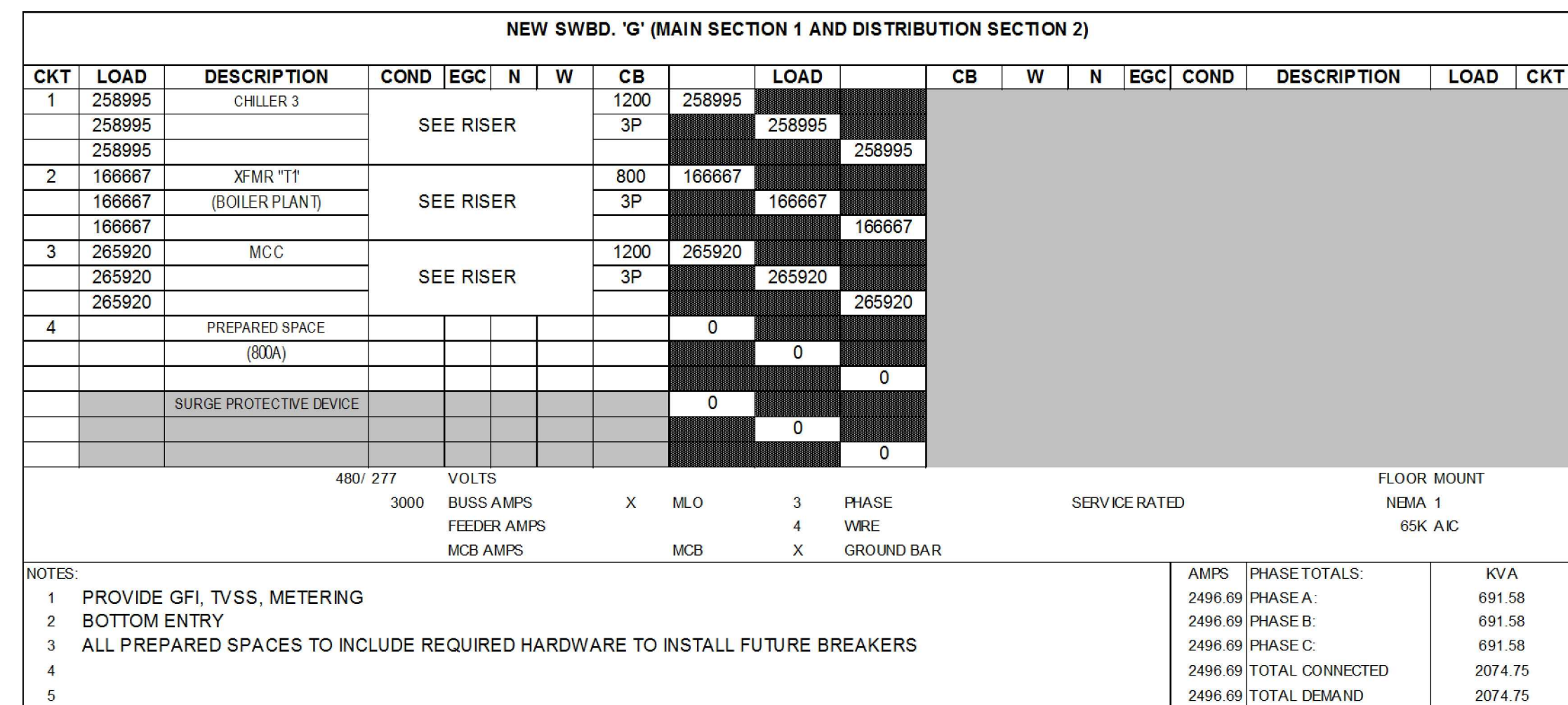
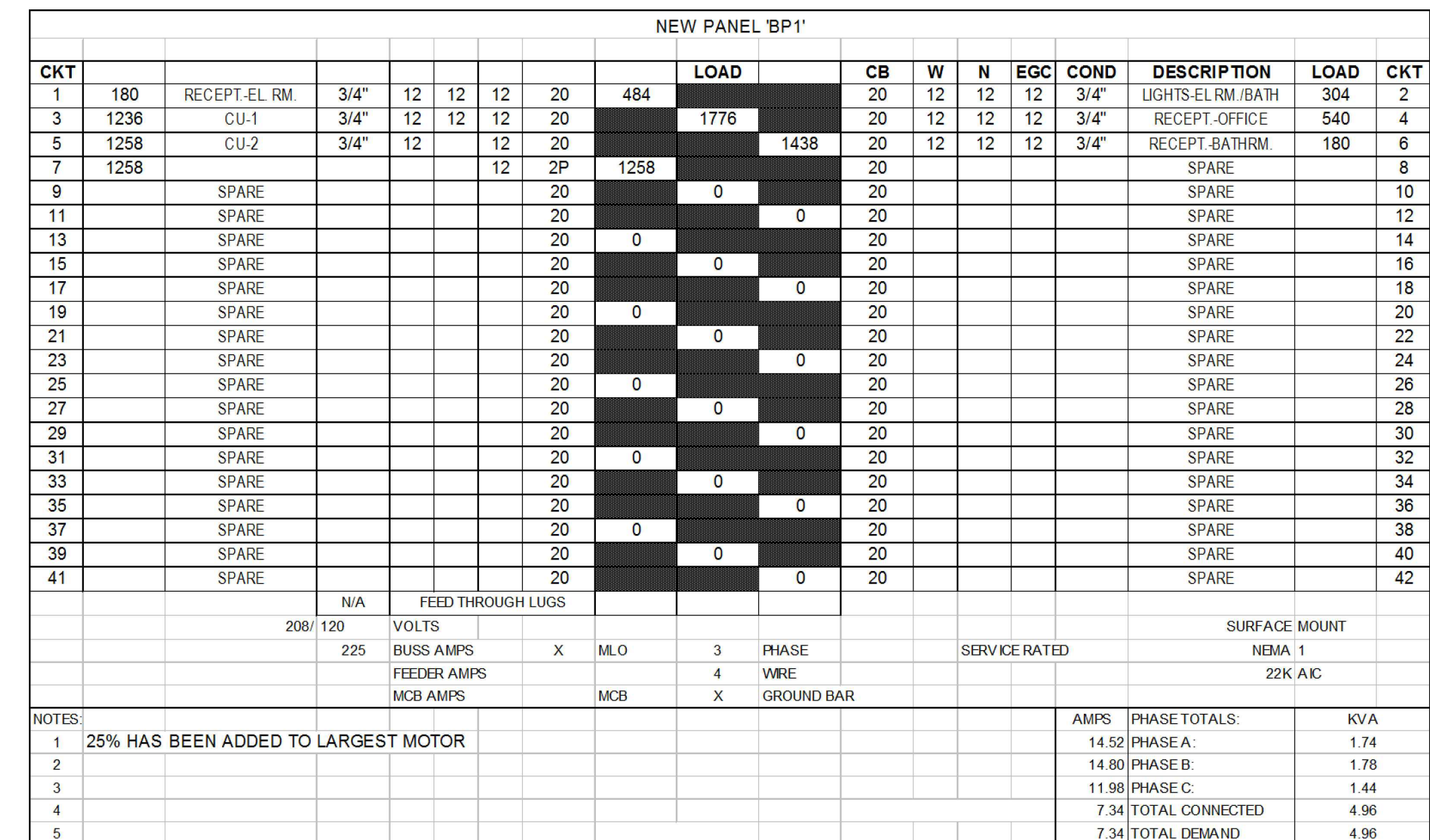
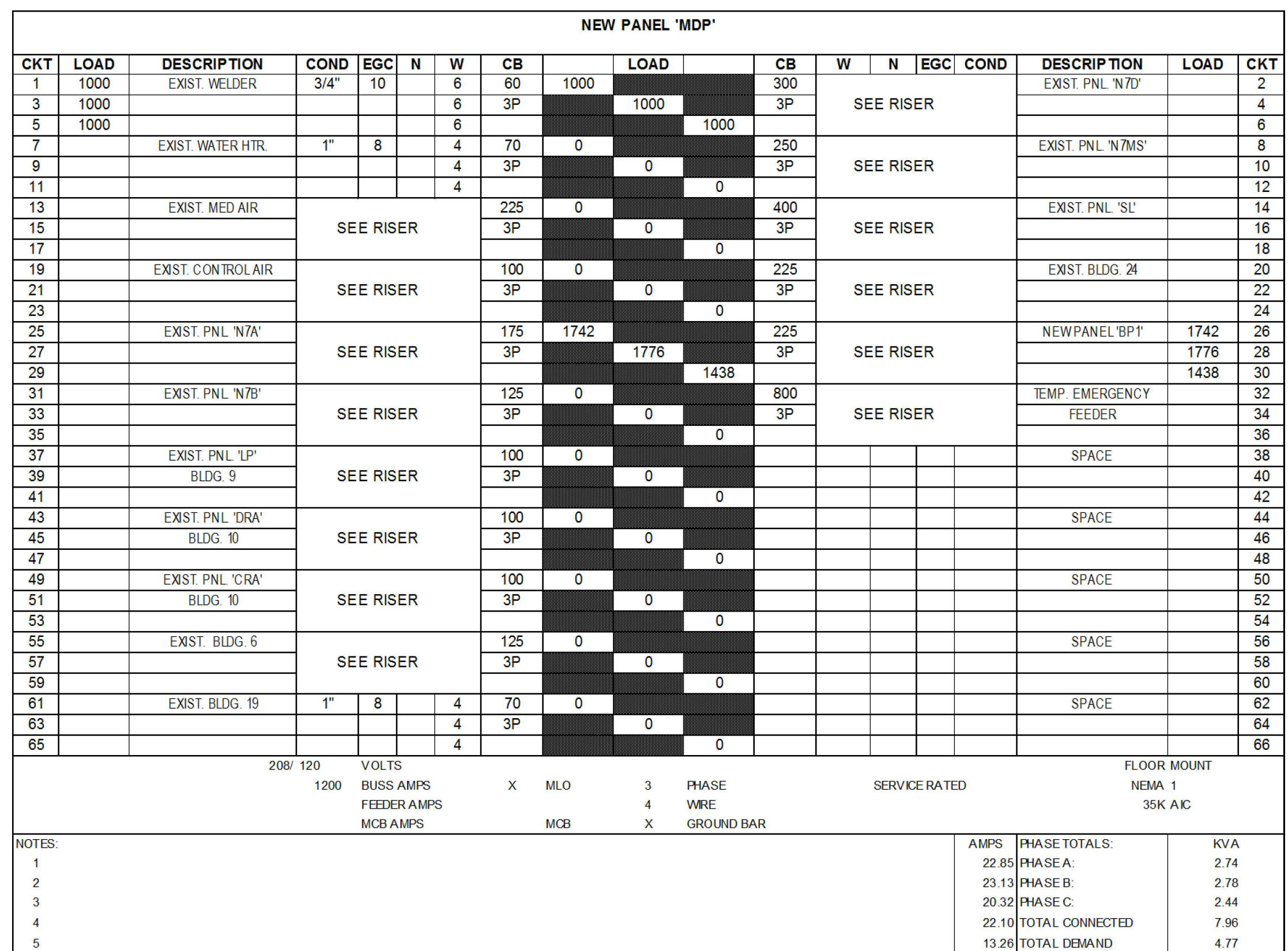
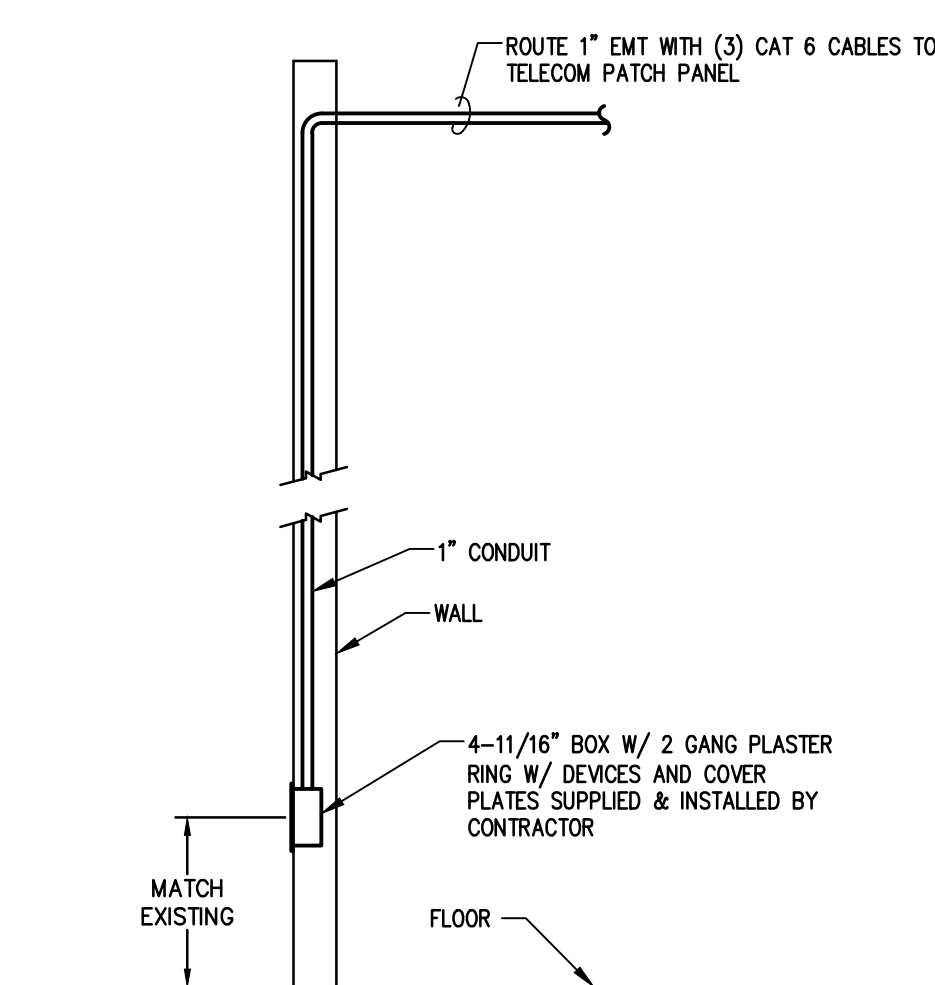
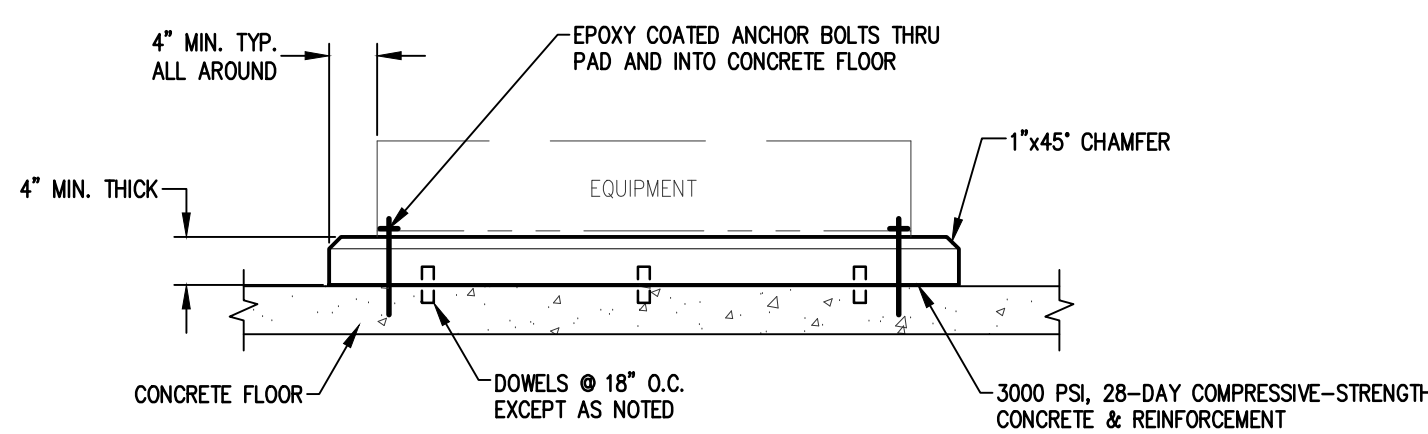
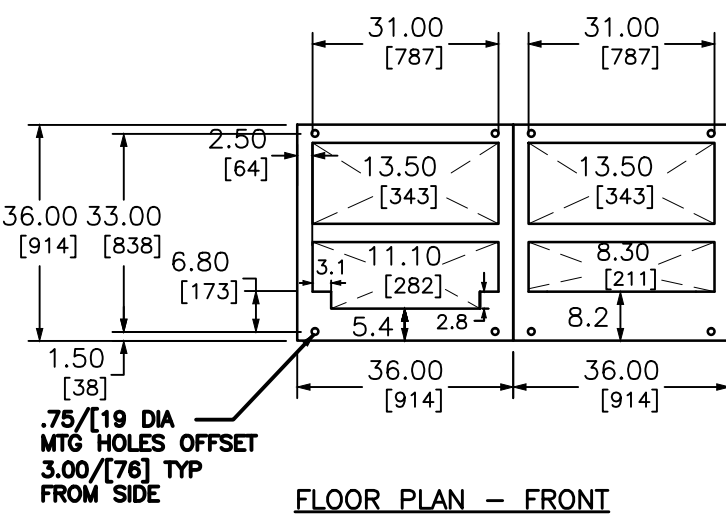
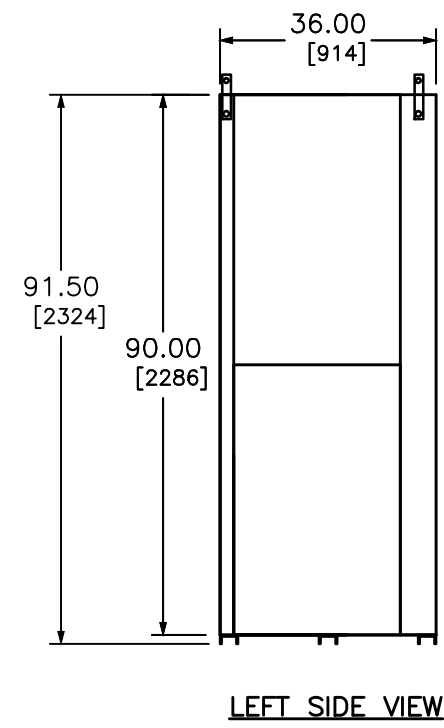
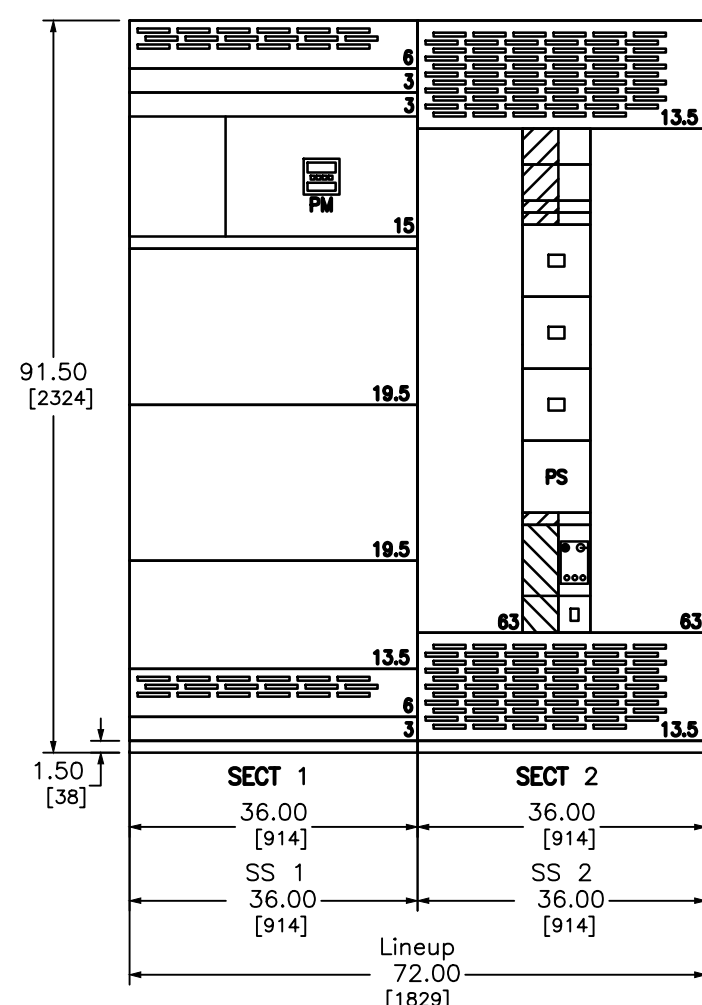
1. USE EXISTING LIGHTING CIRCUIT. REQUIRES (1) #12W, #12N, #12EGC, 3/4" C

LIGHT FIXTURE SCHEDULE								
TYPE		DESCRIPTION	MANUFACTURER	CATALOG NO.	LAMPING	VA	VOLT	REMARKS
A		HEAVY DUTY STRIP, THREE LAMP 4" FIXTURE.	LITHONIA	EJ-3-32-120-232EU	(3) 32WT8	90	120	PROVIDE WITH WIREGUARD, ELECTRONIC BALLAST
B		4" LOW-PROFILE WRAPAROUND, 10" WIDE, ACRYLIC LENS	LITHONIA	LB-2-32-120-1MVOLT	(2) 32WT8	60	120/277	STEM MOUNT, EXACT LOCATION OF LIGHT TO BE FIELD COORDINATED TO AVOID EXISTING PIPES
B1		4" LOW-PROFILE WRAPAROUND, 10" WIDE, ACRYLIC LENS	LITHONIA	LB-2-32-120	(2) 32WT8	60	120	SURFACE MOUNT
C		4" LOW-PROFILE WRAPAROUND, 10" WIDE, ACRYLIC LENS	LITHONIA	LB-2-17-120	(2) 17WT8	32	120	SURFACE MOUNT
D		2" PREMIUM WALL BRACKET, ACRYLIC LENS	LITHONIA	WP-2-17-120	(2) 17WT8	32	120	
EM		DUAL-LITE PG-W LED EMERGENCY LIGHT MOUNTED 96" AFF. POWER FROM UNSWITCHED AREA LIGHTING CIRCUIT.	DUAL-LITE	PG-W	(4) HIGH OUTPUT LED's	17	120	CIRCUIT TO LINE SIDE OF LOCAL SWITCH

NOTES:

1. FIXTURES SHALL BE APPROVED WITH ALL NECESSARY MOUNTING HARDWARE, OPTIONS, AND COMPONENTS AS REQUIRED FOR THE INSTALLATION AND AS DESCRIBED IN THE SPECIFICATIONS.
2. ALL FLUORESCENT FIXTURES WITH LINEAR LAMPS SHALL HAVE ELECTRONIC BALLAST WITH TOTAL HARMONIC DISTORTION OF LESS THAN 10%, POWER FACTOR GREATER THAN .95, BALLAST FACTOR GREATER THAN OR EQUAL TO 90, AND SHALL BE "CMB CERTIFIED". BALLASTS SHALL BE RAPID START AND SHALL BE PARALLEL WIRED IN THREE AND FOUR LAMP VERSIONS.
3. ALL FLUORESCENT LAMPS TO BE 3500K AND SHALL HAVE A CRI RATING OF AT LEAST 85.

1. 1/16"=1'-0" 2. 1/8"=1'-0" 3. 1/4"=1'-0" 4. 1/2"=1'-0" 5. 3/4"=1'-0" 6. 1"=1'-0" 7. 1 1/4"=1'-0" 8. 1 1/2"=1'-0" 9. 1 3/4"=1'-0" 10. 2"=1'-0" 11. 2 1/4"=1'-0" 12. 2 1/2"=1'-0" 13. 2 3/4"=1'-0" 14. 3"=1'-0" 15. 3 1/4"=1'-0" 16. 3 1/2"=1'-0" 17. 3 3/4"=1'-0" 18. 4"=1'-0" 19. 4 1/4"=1'-0" 20. 4 1/2"=1'-0" 21. 4 3/4"=1'-0" 22. 5"=1'-0" 23. 5 1/4"=1'-0" 24. 5 1/2"=1'-0" 25. 5 3/4"=1'-0" 26. 6"=1'-0" 27. 6 1/4"=1'-0" 28. 6 1/2"=1'-0" 29. 6 3/4"=1'-0" 30. 7"=1'-0" 31. 7 1/4"=1'-0" 32. 7 1/2"=1'-0" 33. 7 3/4"=1'-0" 34. 8"=1'-0" 35. 8 1/4"=1'-0" 36. 8 1/2"=1'-0" 37. 8 3/4"=1'-0" 38. 9"=1'-0" 39. 9 1/4"=1'-0" 40. 9 1/2"=1'-0" 41. 9 3/4"=1'-0" 42. 10"=1'-0" 43. 10 1/4"=1'-0" 44. 10 1/2"=1'-0" 45. 10 3/4"=1'-0" 46. 11"=1'-0" 47. 11 1/4"=1'-0" 48. 11 1/2"=1'-0" 49. 11 3/4"=1'-0" 50. 12"=1'-0" 51. 12 1/4"=1'-0" 52. 12 1/2"=1'-0" 53. 12 3/4"=1'-0" 54. 13"=1'-0" 55. 13 1/4"=1'-0" 56. 13 1/2"=1'-0" 57. 13 3/4"=1'-0" 58. 14"=1'-0" 59. 14 1/4"=1'-0" 60. 14 1/2"=1'-0" 61. 14 3/4"=1'-0" 62. 15"=1'-0" 63. 15 1/4"=1'-0" 64. 15 1/2"=1'-0" 65. 15 3/4"=1'-0" 66. 16"=1'-0" 67. 16 1/4"=1'-0" 68. 16 1/2"=1'-0" 69. 16 3/4"=1'-0" 70. 17"=1'-0" 71. 17 1/4"=1'-0" 72. 17 1/2"=1'-0" 73. 17 3/4"=1'-0" 74. 18"=1'-0" 75. 18 1/4"=1'-0" 76. 18 1/2"=1'-0" 77. 18 3/4"=1'-0" 78. 19"=1'-0" 79. 19 1/4"=1'-0" 80. 19 1/2"=1'-0" 81. 19 3/4"=1'-0" 82. 20"=1'-0" 83. 20 1/4"=1'-0" 84. 20 1/2"=1'-0" 85. 20 3/4"=1'-0" 86. 21"=1'-0" 87. 21 1/4"=1'-0" 88. 21 1/2"=1'-0" 89. 21 3/4"=1'-0" 90. 22"=1'-0" 91. 22 1/4"=1'-0" 92. 22 1/2"=1'-0" 93. 22 3/4"=1'-0" 94. 23"=1'-0" 95. 23 1/4"=1'-0" 96. 23 1/2"=1'-0" 97. 23 3/4"=1'-0" 98. 24"=1'-0" 99. 24 1/4"=1'-0" 100. 24 1/2"=1'-0" 101. 24 3/4"=1'-0" 102. 25"=1'-0" 103. 25 1/4"=1'-0" 104. 25 1/2"=1'-0" 105. 25 3/4"=1'-0" 106. 26"=1'-0" 107. 26 1/4"=1'-0" 108. 26 1/2"=1'-0" 109. 26 3/4"=1'-0" 110. 27"=1'-0" 111. 27 1/4"=1'-0" 112. 27 1/2"=1'-0" 113. 27 3/4"=1'-0" 114. 28"=1'-0" 115. 28 1/4"=1'-0" 116. 28 1/2"=1'-0" 117. 28 3/4"=1'-0" 118. 29"=1'-0" 119. 29 1/4"=1'-0" 120. 29 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608. 151 1/2"=1'-0" 609. 151 3/4"=1'-0" 610. 152"=1'-0" 611. 152 1/4"=1'-0" 612. 152 1/2"=1'-0" 613. 152 3/4"=1'-0" 614. 153"=1'-0" 615. 153 1/4"=1'-0" 616. 153 1/2"=1'-0" 617. 153 3/4"=1'-0" 618. 154"=1'-0" 619. 154 1/4"=1'-0" 620. 154 1/2"=1'-0" 621. 154 3/4"=1'-0" 622. 155"=1'-0" 623. 155 1/4"=1'-0" 624. 155 1/2"=1'-0" 625. 155 3/4"=1'-0" 626. 156"=1'-0" 627. 156 1/4"=1'-0" 628. 156 1/2"=1'-0" 629. 156 3/4"=1'-0" 630. 157"=1'-0" 631. 157 1/4"=1'-0" 632. 157 1/2"=1'-0" 633. 157 3/4"=1'-0" 634. 158"=1'-0" 635. 158 1/4"=1'-0" 636. 158 1/2"=1'-0" 637. 158 3/4"=1'-0" 638. 159"=1'-0" 639. 159 1/4"=1'-0" 640. 159 1/2"=1'-0" 641. 159 3/4"=1'-0" 642. 160"=1'-0" 643. 160 1/4"=1'-0" 644. 160 1/2"=1'-0" 645. 160 3/4"=1'-0" 646. 161"=1'-0" 647. 161 1/4"=1'-0" 648. 161 1/2"=1'-0" 649. 161 3/4"=1'-0" 650. 162"=1'-0" 651. 162 1/4"=1'-0" 652. 162 1/2"=1'-0" 653. 162 3/4"=1'-0" 654. 163"=1'-0" 655. 163 1/4"=1'-0" 656. 163 1/2"=1'-0" 657. 163 3/4"=1'-0" 658. 164"=1'-0" 659. 164 1/4"=1'-0" 660. 164 1/2"=1'-0" 661. 164 3/4"=1'-0" 662. 165"=1'-0" 663. 165 1/4"=1'-0" 664. 165 1/2"=1'-0" 665. 165 3/4"=1'-0" 666. 166"=1'-0" 667. 166 1/4"=1'-0" 668. 166 1/2"=1'-0" 669. 166 3/4"=1'-0" 670. 167"=1'-0" 671. 167 1/4"=1'-0" 672. 167 1/2"=1'-0" 673. 167 3/4"=1'-0" 674. 168"=1'-0" 675. 168 1/4"=1'-0" 676. 168 1/2"=1'-0" 677. 168 3/4"=1'-0" 678. 169"=1'-0" 679. 169 1/4"=1'-0" 680. 169 1/2"=1'-0" 681. 169 3/4"=1'-0" 682. 170"=1'-0" 683. 170 1/4"=1'-0" 684. 170 1/2"=1'-0" 685. 170 3/4"=1'-0" 686. 171"=1'-0" 687. 171 1/4"=1'-0" 688. 171 1/2"=1'-0" 689. 171 3/4"=1'-0" 690. 172"=1'-0" 691. 172 1/4"=1'-0" 692. 172 1/2"=1'-0" 693. 172 3/4"=1'-0" 694. 173"=1'-0" 695. 173 1/4"=1'-0" 696. 173 1/2"=1'-0" 697. 173 3/4"=1'-0" 698. 174"=1'-0" 699. 174 1/4"=1'-0" 700. 174 1/2"=1'-0" 701. 174 3/4"=1'-0" 702. 175"=1'-0" 703. 175 1/4"=1'-0" 704. 175 1/2"=1'-0" 705. 175 3/4"=1'-0" 706. 176"=1'-0" 707. 176 1/4"=1'-0" 708. 176 1/2"=1'-0" 709. 176 3/4"=1'-0" 710. 177"=1'-0" 711. 177 1/4"=1'-0" 712. 177 1/2"=1'-0" 713. 177 3/4"=1'-0" 714. 178"=1'-0" 715. 178 1/4"=1'-0" 716. 178 1/2"=1'-0" 717. 178 3/4"=1'-0" 718. 179"


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RECOMMEND APPROVAL	
Requestor:	Date:
Chief of Service:	Date:
Infection Control:	Date:
Requestor:	Date:
Chief of Staff:	Date:
Assoc. Med. Off. Dir.:	Date:

Drawing Title: Electrical Panel Schedules and Details	
Approved Chief, Engineering Svc.	Date:
APPROVED BY:	Date:
MEDICAL CENTER DIRECTOR	

Project Title: Replace Boiler Plant Generator			
Building No. 7&9	Designed by:	Drawn by: CTW	Checked by: JDH

Location VAMC - Durham 508 Fulton Street Durham, North Carolina		<i>Department of</i> VETERANS' AFFAIRS
Date	06-21-2013	
Project No.	558-11-102FCA	
Project ID No.	13-E-07	
DRAWING NO. <div style="font-size: 2em; font-weight: bold; text-align: center;">E302</div>		
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